JANATA SHIKSHAN SANSTHA'S

KISAN VEER MAHAVIDYALAYA WAI

DEPARTMENT OF CHEMISTRY

Number of students undertaking project work 2021-22

M.Sc II

Core Course Practical in Chemistry

SR.NO	NAME OF STUDENTS	NAME OF PROJECT
1	VEDPATHAK PRADNYA RAJENDRA	SYNTHESIS CHARACTERIZATION OF 3,4-DIHYDROPYRIMIDONE-(1 H) ONES OR THIONES
2	SHINDE HARSHADA ANIL	
3	PISAL POOJA SONALI DATTATRAY	SYNTHESIS OF BENZOTRIAZOLE FROM O-PHENYLENEDIAMINE
4	GAIKWAD MEGHA VIKAS	
5	RAJPURE ANJALI ANADRAO	SYNTHESIS OF CARBOXYLIC ACID DERIVATIVES OF BENZOTRIAZOLE
6	SOLASKAR PRATIKSHA GAJANAN	
7	INAMDAR SAIFALI SHABBIR	SYNTHESIS OF BARBITURIC ACID AND ITS DERIVATIVE
8	SHINGATE SANDESH NANDKUMAR	
9	MANDHARE RUTUJA RAMESH	SYNTHESIS CHARACTERIZATION CATALYTIC PROPERTIES OF NANO CRYSTALINE Cu-Zn-Ce OXIDE
10	MANDHARE SAPTAMI SHASHIKANT	
11	CHOUGULE RAHUL HANMANT	SYNTHESIS OF (1,3)OXAZINE DERIVATIVE BY THIAMINE HYDROCHOLRIDE
12	PATIL PANDURANG SHAHU	
13	SALUNKHE RUSHIKESH GAJANAN	SYNTHESIS CHARACTERIZATION OF HETEROCYCLIC COMPOUNDS BY SCHIFF BASES
14	PATIL AMIT VITTHAL	
15	KHADE ANKITA JIVAN	SYNTHESIS CHARACTERIZATION OF O-SUBSTITUTED ANHYDRIDE DERIVATIVES
16	KODAG SNEHA DYANESHWAR	
17	YADAV ARUNA BALASAHEB	GREEN CHEMISTRY APPPROACH TO THE BEGINILLI REACTON
18	MANE AMRUTA GORAKHNATH	

Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

Janata Shikshan Sanstha's

Kisan veer Mahavidyalaya, Wai

(Institute, Affiliated to Shivaji University, Kolhapur)

Department of Chemistry

CERTIFICATE

This is to certify that, **Mr. Chougule Rahul Hanamant** and **Mr. Patil Pandurang Shahu** has successfully completed the project work and submitted project report on "Synthesis of [1,3]oxazine derivatives catalyzed by thiamine hydrochloride (VB1) in water" for the partial fulfillment of the requirement for the degree of Master of Science in **Organic Chemistry** from the Department of **Chemistry**, as per the rules and regulations of Kisan Veer Mahavidyalaya, Wai, Dist: Satara.

Date: 04/06/2022

Place: KVM, Wai

04/06/22

Mrs. D. S. Patil
Name and Sign of Supervisor

04-06-22

Mr. A. A. Dhanawade
Name and Sign of Supervisor

Name:

Name and Sign of External Examiner

04/06/2022

Dr. P. H. Bhoite
Name and Sign of Head of Department

Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to certify that, following candidates ***Miss. Khade Ankita Jivan And Miss. Kodag Sneha Dnyaneshwar*** of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled ***"SYNTHESIS AND CHARACTERIZATION OF N AND O SUBSTITUTED ANHYDRIDE DERIVATIVES"*** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :-11/6/2022

Place :- Wai.

11/06/22
Guide

(Mrs. D.S.Patil)

Examiner

11/06/22
Head of Department

Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to certify that, following candidates ***Miss. Pooja (Sonali) Dattatray Pisal and Miss.Megha Vikas Gaikwad*** of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled ***"Synthesis of Benzotriazole from O-phenylenediamine."*** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :-04/06/2022

Place :- Wai.

04/06/22
Guide

(Mrs. D.S.Patil)

Examiner

04/06/2022
Head of Department

Head
Department Of Chemistry
Kisan Veer Mahavidyalaya, Wai

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to certify that, following candidates ***Mr.Inamdar Saifali Shabbir And Mr. Shingate Sandesh Nandkumar*** of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled ***"Synthesis of Barbituric acid and it's Derivative"*** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :- / /2022

Place :- Wai.

04/06/22

Guide

(Mrs. D.S.Patil)

Examiner

04/06/2022

Head of Department

Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to certify that, following candidates Miss. Yadav Aruna Balasaheb & Miss. Mane Amruta Gorakhnath of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled ***"Green Chemistry Approach to the Beginelli Reaction: Synthesis of Dihydropyrimidinones"*** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :-11/06/2022

Place :- Wai.

11/06/22

Guide

(Mrs. D.S.Patil)

Examiner

11/06/22

Head of Department

Head
Department Of Chemi
Kisan Veer Mahavidyalay

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to Certify that, following candidates ***Miss. Solaskar Pratiksha Gajanan and Miss. Rajapure Anjali Anandrao*** of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled ***"Synthesis of carboxylic acid derivative of benzimidazole using various organic acids"*** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :- 04/06/22

Place :- Wai.

04/06/22

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(Mrs. D.S.Patil)

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Head of Department

Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to certify that, following candidates ***Miss. Mandhare Saptami Shashikant And Miss. Mandhare Rutuja Ramesh*** of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled **"*STUDIES* ON SYNTHESIS, CHARACTERIZATION AND CATALYTIC PROPERTIES OF NANOCRYSTALLINE Cu-Zn-Ce OXIDE SYSTEM"** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :-4/6/2022

Place :- Wai.

Guide

Examiner

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Head of Department

(Dr.H.V.Jadhav)
Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

Kisan Veer Mahavidyalaya, Wai.

Dist. – Satara

Department of Chemistry

Certificate

This is to certify that following candidates: **Miss. Pradnya R. Vedpathak** and **Miss. Harshada A. Shinde** of **M.Sc. – II (Organic Chemistry)** have successfully completed the project work entitled **"Synthesis, Characterisation and Biological activity of 3,4 – dihydropyrimidine – 2(1H) – ones / thiones by using Biginelli Reaction at solvent free condition"** in practical fulfilment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021 – 2022.

Date:- 3-6-2022

Place:- Wai.

Guide
03/06/22
Mrs. D.S. Patil

Examiner
GsRashin

Head
Department of Chemistry
Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai
Reshanti
04/06/22

M.Sc II 17.18

4

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

2021-2022

A

Project Report

On

"Green Chemistry Approach to the Beginelli Reaction: Synthesis of Dihydropyrimidinones"

The project submitted to the Shivaji University of Kolhapur, practical

The Project Submitted To The

SHIVAJI UNIVERSITY OF KOLHAPUR, IN PRACTIAL FULFILEMNT OF THE

REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE IN ORGANIC CHEMISTRY.

BY

Miss. Yadav Aruna Balasaheb

Miss. Mane Amruta Gorakhnath

UNDER THE GUIDANCE OF

Mrs. D. S. Patil

JANATA SHIKSHAN SANSTHA'S

Kisan Veer Mahavidyalaya, Wai

Dist-Satara

DEPARTMENT OF CHEMISTRY

Certificate

This is to certify that, following candidates Miss. Yadav Aruna Balasaheb & Miss. Mane Amruta Gorakhnath of M.Sc.-II (Org. Chem.) has successfully completed the project work entitled ***"Green Chemistry Approach to the Beginelli Reaction: Synthesis of Dihydropyrimidinones"*** in practical fulfillment of the award of Master of Chemistry as laid down by the **Shivaji University, Kolhapur** during the academic year 2021-2022.

Date :-11/06/2022

Place :- Wai.

11/06/22

Guide

(Mrs. D.S.Patil)

Examiner

11/06/22

Head of Department

Head
Department Of Chemistry
Kisan Veer Mahavidyalaya,Wai

Acknowledgement

Foremost, it gives me immense pleasure to express my sincere thankful to my research guide ***Mrs. D. S. PATIL,*** Department of Chemistry, for his guidance and constant support from the initial to final level which enabled me to develop an understanding of the problem. His enthusiasm and optimism of science is an invaluable source of inspiration for me. It was great pleasure and privilege to study under his mentorship.

I would like to thanks ***DR. G .J. Fagare,*** Principal of Kisan Veer College, for providing facilities to carry out me search work in college laboratory.

I am very much thankful to ***Mr. A. A. Dhanawade*** sir, ***Mrs .D. S. Patil*** for their continuous support during my research work.

I would like to thanks to ***Dr. P. H. Bhoite*** Head Department of Chemistry, ***Dr. H. V. Jadhav, Dr.D. N. Zambre.*** Sir for constant support and thanks to non-teaching staff, ***Mr. A. S. Sawant & Mr. A. Shelar*** KisanVeer Mahavidyalaya, Wai.

Miss.Yadav Aruna Balasaheb

Miss. Mane Amruta Gorakhnath

DECLARATION

I hereby declare that the project entitled *"Green Chemistry Approach to the Beginelli Reaction: Synthesis of Dihydropyrimidinones"* Completed and written by me under the guidance and supervision of Mrs. D. S. Patil has not previously formed the basis for the award of our Degree for and other university or examining body in academic year 2021-2022.

Place-Wai

Date-11/06/2022

Sr. No.	Roll No.	Name of students	Sign
1	17	Miss. Yadav Aruna Balasaheb	
2	18	Miss.Mane Amruta Gorakhnath	

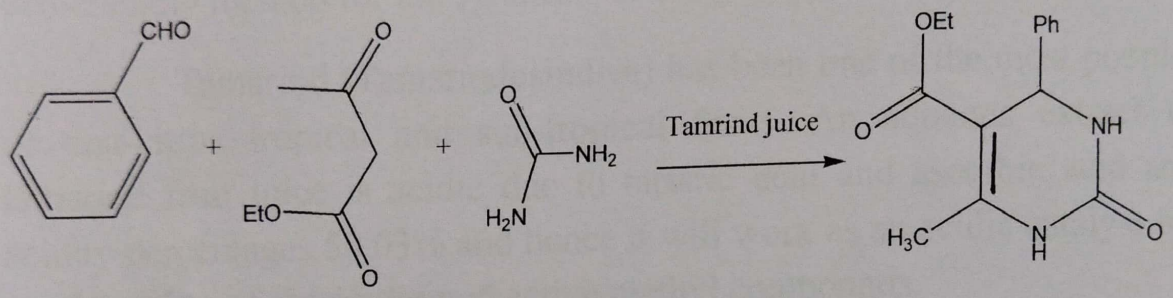
INDEX

Abstract

The biginelli reaction is a one-pot acid catalysedcyclocendation of ß-keto esters, urea and aromatic aldehyde which leads to the synthesis of functional 3,4-dihydry-(2H)-pyrimidinone (DHMP's). the three component reaction for the synthesis of dihydropyrimidinone and corresponding dihydropyrimidinethiones has now been for more than century in 1893. Owing to the increasing use of green technology approach, due to its various merites over classical methodology and as a need for sustainable sustainable chemistry. The reaction has received renewed intrest for preparing DHMP's in an environmentally thoughtfull manner with improved yields. The classical reaction has been modified in recent past by using various catalysts and several structrial variants in different solvents to synthesize large no of beginelli type compounds. Also, these DHMP's posses a wide range of pharmacological activities. In this present review the literature available methods related to large no of biginelli type compounds synthesized using bio catalysts allows mild and highly selectivity transformation and synthesis in a facial and environmentally friendly manner. Moreover, fruits are inexpensive and easily available in the market, the extracted juice can be easily used as catalyst in the organic transformations.

Introduction

Since more than one hundred year, Biginelli suggested a dyhudropyrimidinr ring construction based on the use ofß-dicarbonyl compounds as a scource of two carbon fragments with aldhyeds and urea or thiourea, ethyl acetoasetate as N-C-N fragment. It is beginelli reaction for the synthesis of DHMP derivatives.

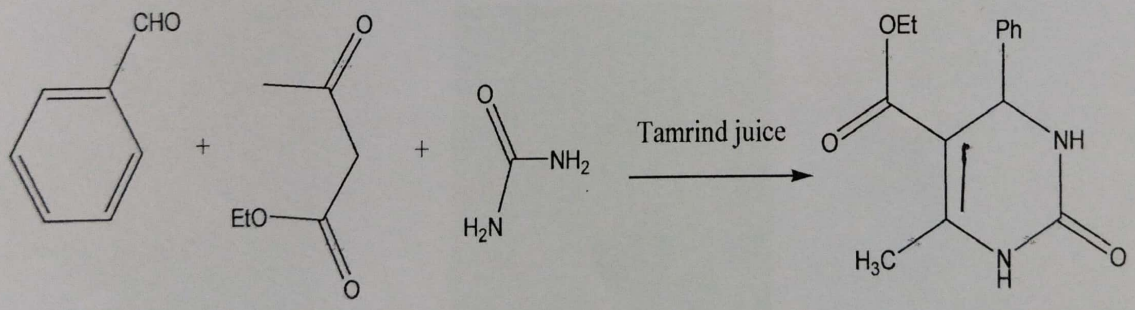


For concer of green technology approach, due to its various merits over classical methodology and as a need for sustainable chemistry, this reaction received renewed intrest for preparing DHMP in environmentally thoughtfull manner with imoroved yield. This protocol couples the benefits of Biginelli reaction with that of greener approach for organic transformations, thusfaciliting efficient synthesis of bio active compounds in environmentally being ways

01. Tamarind juice one pot synthesis of Dihydropyrimidinone and Thione under ultrasound Irradiation at Ambident conditions: A Green Approach.

Multicomponent reactions have apparently been a road to synthesis of large number of compounds. The hold an upper hand over multistep synthesis owing to their efficiency, cast effectiveness, easy operation, high product complexity and large molecular diversity. The growing concern for the environmental demands the development of eco-friendly bio catalyst like various type of fruit juice is also considered as eco-friendly method for the synthesis of Dihydropyrimidinone(DHMP).

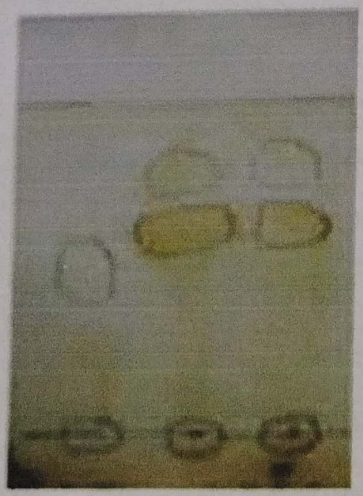
Tamarind (Tamarindusindica) has been one of the most popular of non-citrus tropical and sub-tropical fruits. An aqueous extract of tamarind fruit juice is acidic due to tartaric acid and ascorbic acid and acidity percentages 50.03% and hence it will work as an acidic catalyst for condensation of aldehydes and active methyl compounds.



In addition to these we reported synthesis of DHMP's and thiones derivatives which was accomplished by Biginelli reaction between substituted aryl aldehydes, ethyl acetoacetate and urea using natural catalyst tamarindusindica and sound irradiation.

Thin Layer Chromatography

Thin layer chromatography is an important chromatography technique can be used to monitor the progress of a reaction, identify compounds present in a given mixture, & to determine the purity of a substance. The thin layer chromatography is performed on a sheet of glass, aluminum foil, which is coated with a thin layer of absorbent material, usually silica gel. Thin layer of absorbent is known as the stationary phase. After the sample has been applied on the plate, a solvent mixture (known as mobile phase) is drawn up the via capillary action.



3,4-dyhydropyrimidin-2(1h)-ones

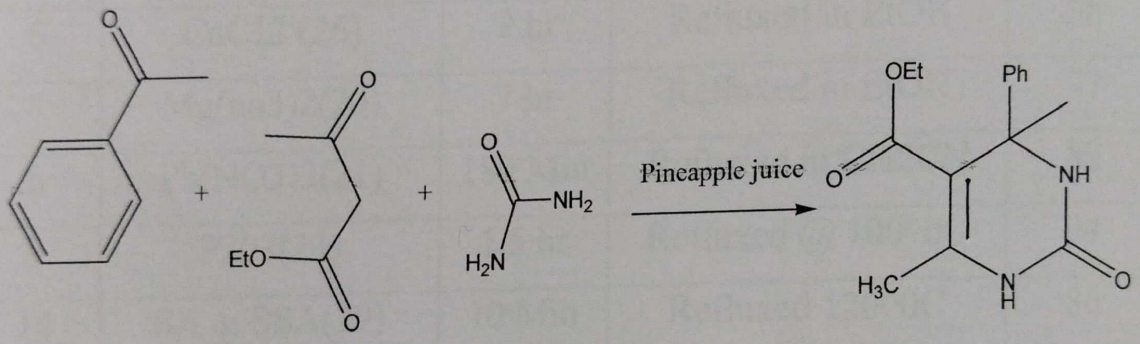
Table no 01:- Tamarind Juice Catalysed Synthesis of 3,4-dyhydropyrimidin-2(1h)-ones and thiones under Ultra sound conditions.

Sr. No	R	R1	X	Yield (%)	M.P(C) Observed	M.P(C) Reported
1	C6H5	OEt	O	94	202-203	(201-203) (41)
2	4-OMe	OEt	O	95	201-203	(199-201)(41)
3	4-OH-C6H5	OEt	O	93	225-226	(226-228)(42)
4	2-OH-C6H5	OEt	O	83	200-202	(220-202)(43)(230)(44)
5	3-NO2-C6H5	OEt	O	93	228-230	(210-212) (45)
6	C6H5	OEt	S	92	208-210	(210-212)(45
7	4-OMe-C6H5	OEt	S	84	136-138	(137-139)(46)
8	2-CI-C6H5	OEt	S	88	202-204	(205-206)(47)
9	2-OH-C6H5	OEt	S	80	188-190	183-185)(48)
10	4C1-C6H5	OEt	S	92	182-184	(180-182)(49)

Entry	Catalyst	Time	Temperature	Yield(%)
1	p-TSA(50)	1 hr	Refluxed in EtOH	90
2	ZnCl2(51)	30 sec	M.W irradiation	94
3	ZnBF4(52)	4 hr	Stirring at RT	71
4	HSO3CI(53)	10 min	Ultrasound, room temp	93
5	CacL(54)	2 hr	Refluxed in EtOH	98
6	InBr3(55)	7 hr	Refluxed in EtOH	97
7	Mg(NO3)2(56)	45 min	Refluxed	90
8	P2O(57)	10 min	M.W. irradiation	90
9	Pb(NO3)3(58)	180 min	Refluxed in acentonitrile	89
10	5-sulfosalicylic acid 59)	3.3 min	M.W irradiation	75
11	Tamarind Juice	3 min	Ultrasound irradiation	95

02.Pineapple juice extract as natural catalyst, an excellent catalyst for Biginelli Reaction.

For discovery and development of non hazardous and simple environmentally safe chemical process by identifying reaction condition and solvents for improved selectivity, energy conservation and less hazarzous waste generation are non-desirable and inherently safer chemical product. Therefore a natural catalysts pineapple juice with pH 3.7 (acidic) is found to be suitable for many reactions. And acidity percentage is 53.5%. hence it works as acid catalyst.



In addition to this the synthesis of DHMP's accomplished by Biginelli reaction between substituted benzaldehyde, ethyl acetoacetate, urea using natural and biocatalysts. Results are shown in table no OR below.

Table no 03: Comparison for different catalysts used for synthesis of DHMP's (R=pOCH3C6H4)

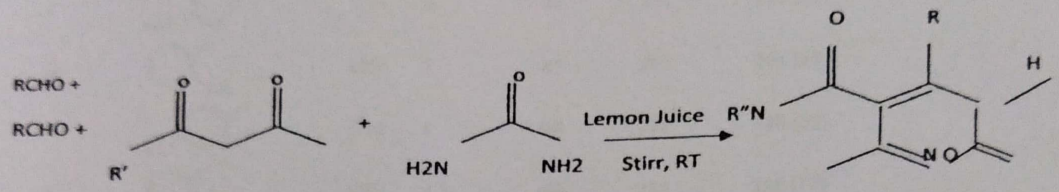
Entry	Catalyst	Time	Temperature	Yield(%)
1	p-TSA(31)	1 hr	Refluxed in FtOH	90
2	RuC13(29)	4.5 hr	Refluxed in N2 atm	82
3	Zn(BF)4(32)	4 hr	Stirring at RT	71
4	Y(OAC)3(27)	4.5 hr	115^0c	89
5	Mg(NO3)2(20)	45 Min	Refluxed	90
6	CaC12 (26)	2 hr	Refluxed in EtOH	98
7	Mg(no3)2(20)	7 hr	Refluxed in EtOH	97
8	Pb(NO3)2(21)	180 Min	Refluxed in CH2CN	89
9	P203(23)	1.5 hr	Refluxed @ 100^0C	94
10	SA & SSA(39)	10 Min	Refluxed 120^0C	86
11	E4a(33)	8 hr	Heated at 80^0	91
12	AMA(35)	35 Min	Heated at 60^Oc	96
13	Yattna-zirconia lewis acid(40)	6 hr	Aq. Ch2CN 60^0C	92
14	Silica Chloride(34)	3 hr	Heated at 80 ^C	90
15	Pineapple	3.5hr	Stirring at RT	82

Hearin, we report a single step synthesis of DHMP's using pineapple juice as natural catalyst under solvent free conditions. As per literature survey there are no earlier reports of pineapple juice as catalyst for biginelli reaction. In addition to its clean and simplicity, this catalyst resulted in higher yields for different aromatic aldehydes.

03. Natural Acid-catalysed Multi- component Reaction as a Green Approach.

Scheme 02

Due to growing concern of environmental demands the development of eco-friendly and economic process where in even less hazardus byproducts are not desirable. A natural catalyst lemon juice with pH of 2.4 (acidic) if found to be sustainable for many reactions. In this research paper, the researcher worked on application of solvent free and single step cyclocendation reaction of aldehydes, diketone, and urea with high yields.



Recently, due to improve and modify in this reaction by Suresh Patil, Swati Jadhav, and M.B Deshmukh, reported as synthesis of DHMP's accomplished by Biginelli reaction between aldehyde, B-keto ester and urea, using natural and bio catalyst lemon juice at room temperature. The results are shown in table no 05 given bellow.

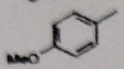
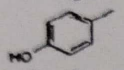
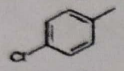
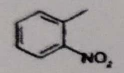
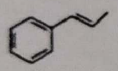
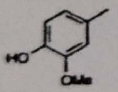
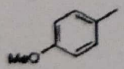
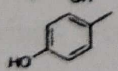
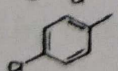
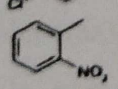
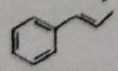
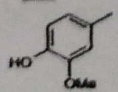
Table no: 05

Entry	Catalyst	Time	Temperature	Yield(%)
1	p-TSA(23)	1 hr	Refluxed in EtOH	90
2	ZnCl2(20)	30 sec	MW irradiation	94
3	Zn(BF)4(25)	4 hrs	Stirring at RT	71
4	Y(OAC)3(17)	4 hr 30 min	115^0 c	89
5	Mg(NO3)2(10)	45 min	Refluxed	90
6	CaCl2(16)	2 hrs	Refluxed in EtOH	98
7	InBr3(14)	7 hrs	Refluxed in EtoH	97
8	Pb(NO3)2(31)	180 min	Refluxed in CH3CN	89
9	P205(32)	1.5 hr	Refluxed at 100^oc	94
10	Citric acid (33)	1hr	80^0C	79
11	Lemon Juice	2 hrs	Stirring at RT	91

Due to broad biological activity and being important class of organic compound, DHMP and its derivative are very important natural products. In 1983 Biginelli reported synthesis of DHMP which is acid catalysed on pot three component reaction between aldehyde ß-ketoester and urea. It suffered many drawbacks like long time and lower yields. Due to important biological properties manyb attempts were made to synthesise DHMP using various such as [Mg(nO3)2] [10], lanthanum chloride, heptahydrate, oxalic acid[12]

Herein, report a one pot synthesis of DHMP using lemon juice as a natural catalyst under solvent free condition. There are no earlier reports to lemon juice as catalyst for Biginelli reaction. In addition to its simplicity this catalyst resulted in higher yield for different aromatic aldehydes.

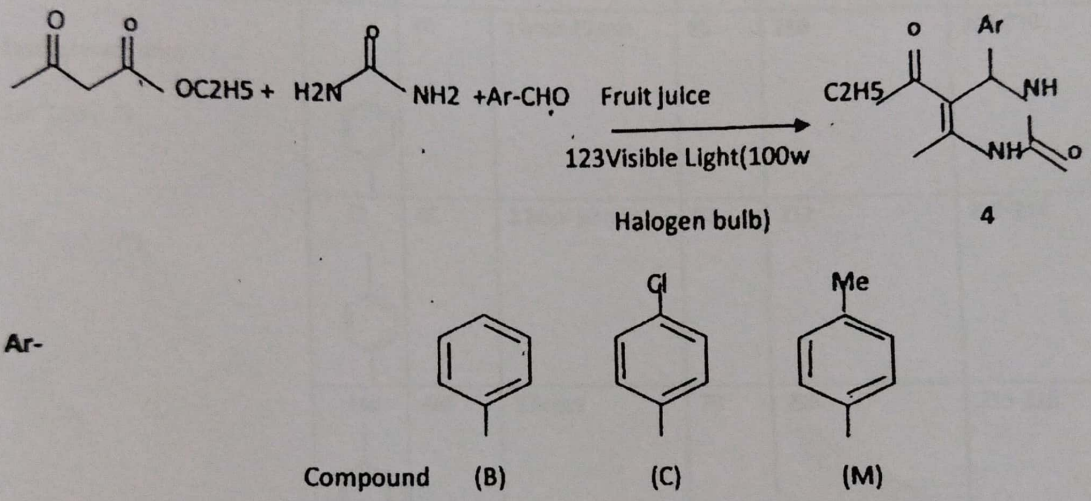
Table no 06 no: Lemon juice catalysed synthesis of DHMP

Entry	R	R^1	Time (hours)	Yield (%)	M.P. Found	Reported
1		OEt	1.5	89	205	202 [25]
2		OEt	2	91	201	203 [25]
3		OEt	2	85	203	201 [25]
4		OEt	1	90	221	226 [25]
5		OEt	2.5	89	215	218 [17]
6		OEt	4	92	212	215 [25]
7		OEt	2	90	210	208 [25]
8		OEt	1	92	230	232 [25]
9		OEt	4-5	89	200	203-205 [31]
10		OEt	1.5	90	214	215 [34]
11	H	OEt	1	54	234	-
12		Me	2	91	231	233 [25]
13		Me	2	94	172	166 [25]
14		Me	2.5	89	221	-
15		Me	2.5	91	254	-
16		Me	2	98	242	-
17		Me	4.5	95	276	-
18		Me	2	92	232	234-236 [31]
19		Me	4	90	240	-
20		Me	2.5	89	196	-
21		Me	1	94	228	-
22	H	Me	2	61	230	-

04. Visible Light Induced Biginelli Reaction in Fruit Juice Medium. A Green Strategy for Synthesis of Pharmaceutically Active DHMP's.

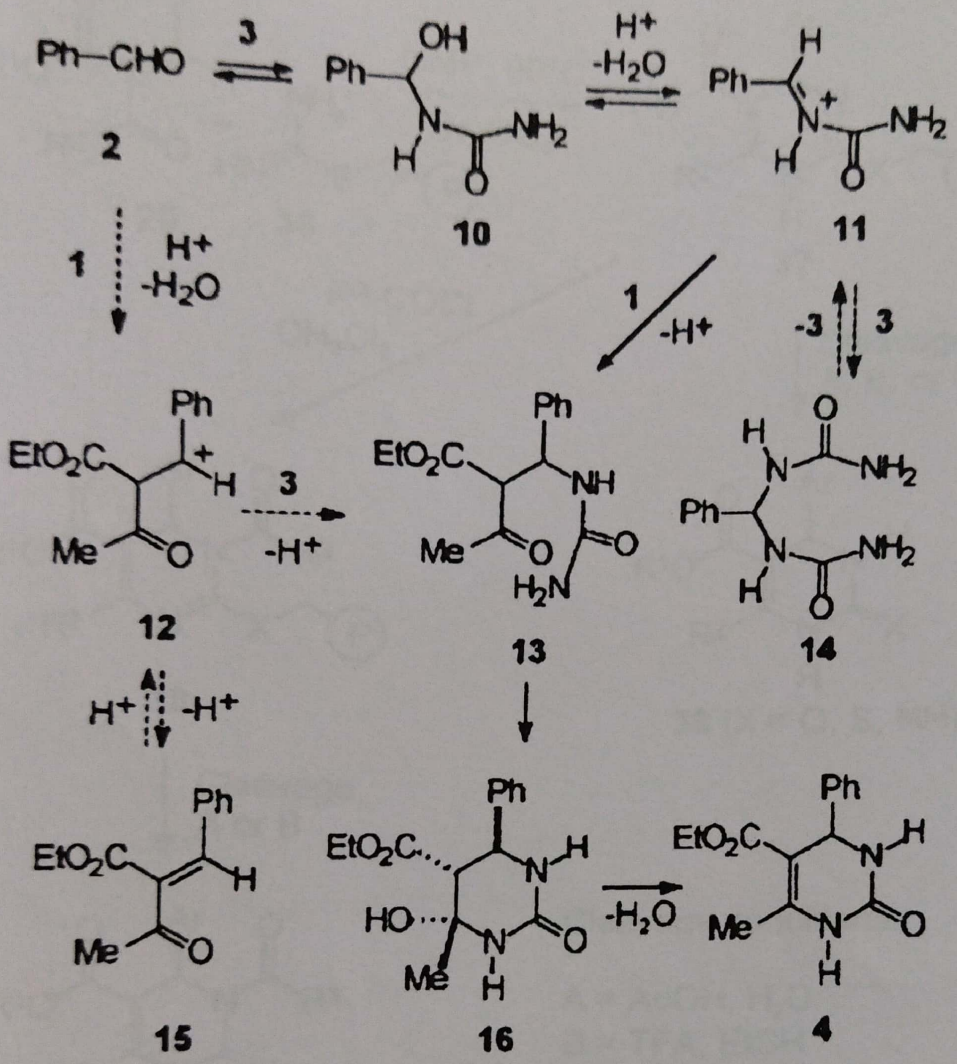
Dihydropyrimidinone is an N-containing heterocyclic compound. In medical and pharmaceutical chemistry it is widely used as like anti-bacterials, anti-inflammatory, anti-cancer etc. in continous research work of microwave assisted Green Biginelli reaction in wide variety of fruite juice like orange, ime, amla, apple, pomegranate, grape, pineapple, tamrind. Here reported green synthesis of DHMP by visible light induced green synthesis is well known. Main object is that, green synthesis of DHMP via visible light induced green Biginelli Reaction using fruit juice.

Scheme02:

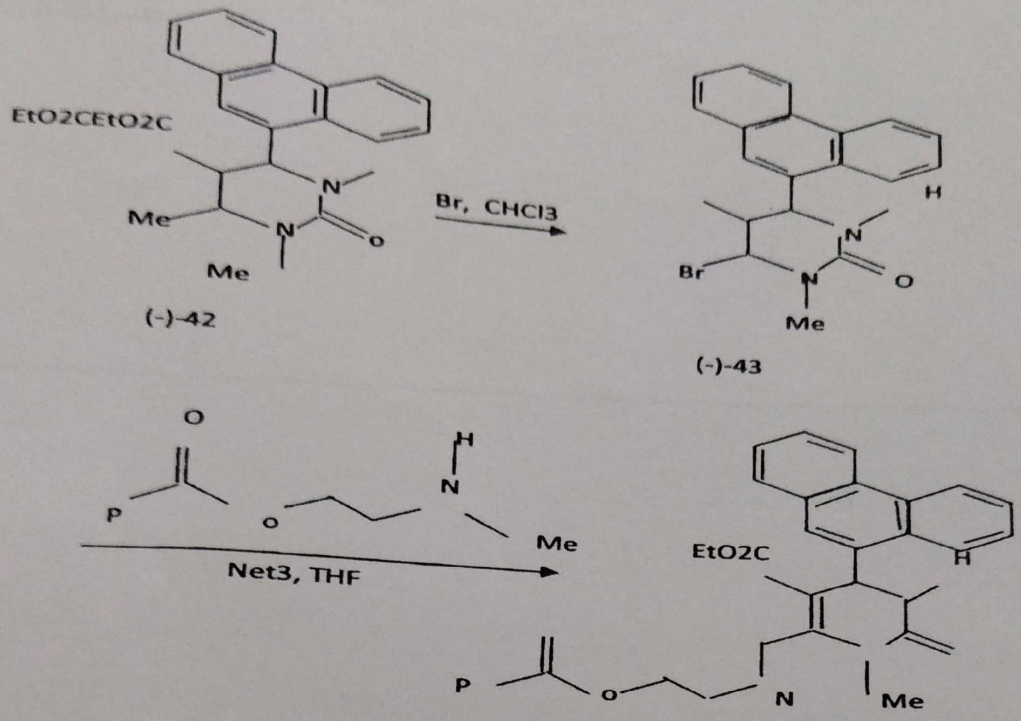


A series of DHMP containing both electronrich as well as electron defficient aromatic rings were synthesized with an excellent percentage of yields via visible light induced green beginelli reaction in fruit juice medium. This is experiment was performed by TanmayPramanik, Simarjit Kaur Padan and Richa Gupta. Reaction was an equimolar mixture of urea, ethyl acetoacetate, and aromatic aldheyde as reactant, where apple, pomegranate and grape juice were used as eco friendly bio degradable and green reaction medium for the same. All reactions are carried out by applying visible light as an eco friendly source of energy. The results are shown in table below no 07

Scheme no 04: Mechanism of the Beginelli Reaction.



Scheme 06: Preparation of a DHMP-Based Chiral Stationary Phase



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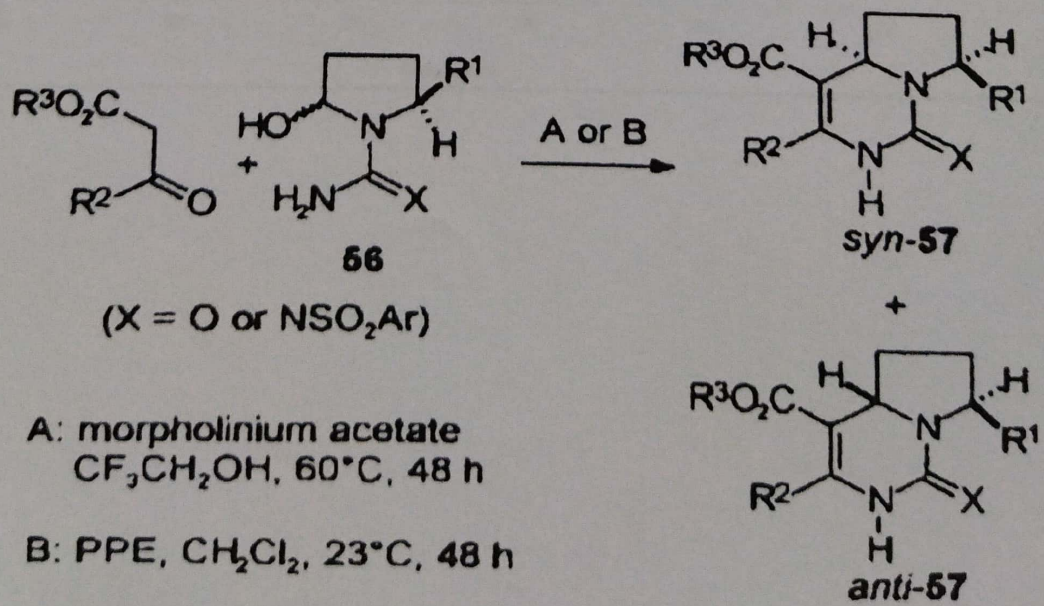
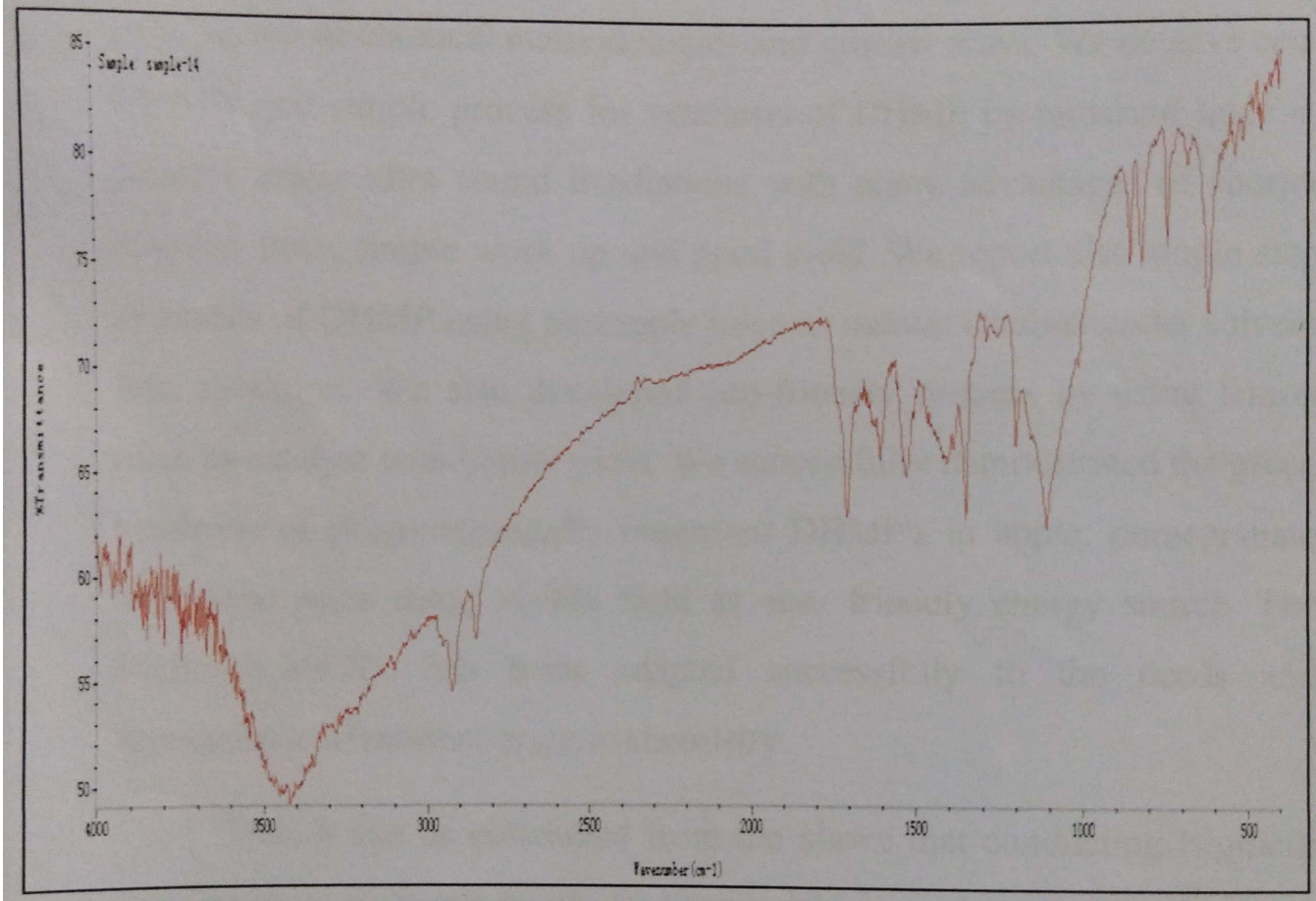
Due to recent advances in preparative chromatography enantioseperation technique, enantio selective technique HPCL and related methods gained in synthesis of single enantiomer drug and intermediate.

Scheme 5. Tuning Stereoselectivities in Tethered Biginelli Reactions



Sample:- 1



Conclusion

The environmental and economic perspectives behind the urgency of finding new molecules in quick time, are making it obvious to change the traditional unsustainable methods of chemical synthesis. Owing to vast interest in the biginelli reaction, it has acted as a viable medium for the comparison of classical methodologies and greener ways. We deserve eco-friendly and simple process for synthesis of DHMP by tamarind juice as catalyst under ultra sound irradiations with many advantages of shorter reaction time, simple work up and good yield. We report also single step synthesis of DHMP using pineapple juice as natural catalyst under solvent free condition. We also developed eco-friendly process by using lemon juice as catalyst with higher yield. We successfully demonstrated the green synthesis of pharmaceutically important DHMP's in apple, pomegranate and grape juice using visible light as eco- friendly energy source. The Biginelli MCR's has been adapted successfully to the needs and expectations of modern organic chemistry.

Thus it can be concluded from the above that conducting Biginelli reaction in an environmentally free manner in more than one way has been found to be economical apart from protecting environment.

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