गुरू घासीदास विश्वविद्यालय (केन्द्रीय विश्वविद्यालय अधिनयम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय) कोनी, बिलासपुर - 495009 (छ.ग.)

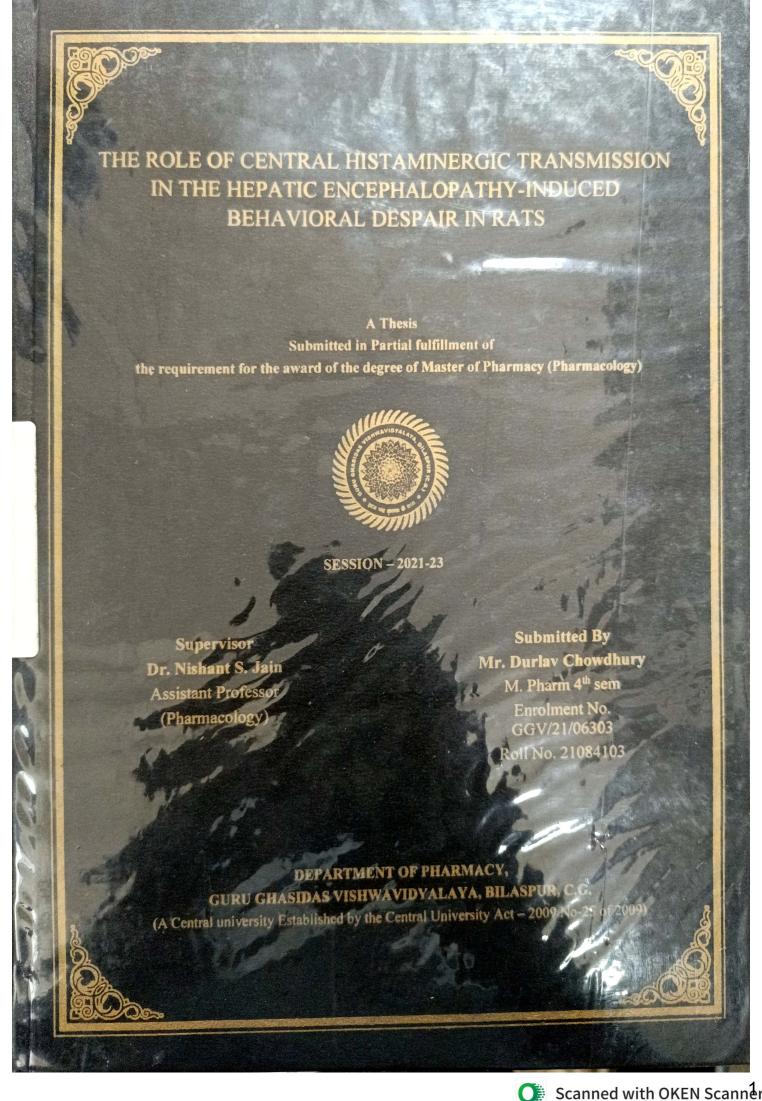


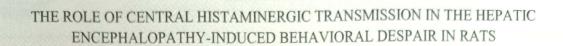
Guru Ghasidas Vishwavidyalaya (A Central University Established by the Central Universities Act 2009 No. 25 of 2009) Koni, Bilaspur – 495009 (C.G.)

Department: Department of Pharmacy					
Academic Year: 2022_23					
S.No. Programme Code Name of the Programme					
01 2022 337 M.Pharm (Pharmacology)					

Following students have carried out their Project work/ Internship/ Field Project/Industrial Training for the academic session 2022-23

S.No.	Name of Students	Page No.
1	DURLAV CHOWDHURY	1-9
2	RIYA PAL	10-14
3	ANANTIKA RAHI	15-23
4	DIPENDRA NIRMALKAR	24-29
5	OMPRAKASH PATEL	30-37
6	RESHMEE YADAV	38-42





A Thesis Submitted in Partial fulfillment of the requirement for the award of the degree of Master of Pharmacy (Pharmacology)



SESSION - 2021-23

Supervisor Dr. Nishant S. Jain **Assistant Professor** (Pharmacology)

Submitted By Mr. Durlay Chowdhury M. Pharm 4th SEM Enrolment No. GGV/21/06303 Roll No. 21084103

DEPARTMENT OF PHARMACY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, C.G.

(A Central university Established by the Central University Act - 2009 No-25 of 2009)





DEPARTMENT OF PHARMACY

GURU GHASIDAS VISHWAVIDYALAYA (A Central University) Central University Established by the Central University Act 2009 No. 25 of 2009) Koni, Bilaspur, C.G.-495009

Tel.:07752-260027 (O); 98271-50112 (R), fax; 07752-260148, 260154

FORWARDING CERTIFICATE

This is to certify that Mr. Durlav Chowdhury a student of M. Pharm. 4th Semester (Pharmacology) of this Institute has submitted his thesis entitled "THE ROLE OF CENTRAL HISTAMINERGIC TRANSMISSION IN THE HEPATIC ENCEPHALOPATHY INDUCED BEHAVIORAL DESPAIR IN RATS" under the supervision of Dr. Nishant S. Jain (Assistant Professor) for the partial fulfillment of Master of Pharmacy in Pharmacology.

I hereby forward his thesis for the award of M.PHARM. (Pharmacology) during the academic session 2022-23.

Prof. (Dr.) Bharti

(Head) Head

Department of Pharmacy Guru Ghasidas Vishwavidyalaya (A Central University) Bilaspur (C.G.)



DEPARTMENT OF PHARMACY

GURU GHASIDAS VISHWAVIDYALAYA (A Central University) Central University Established by the Central University Act 2009 No. 25 of 2009) Koni, Bilaspur, C.G.-495009

Tel.:07752-260027 (O); 98271-50112 (R), fax; 07752-260148, 260154

CERTIFICATE

This is to certify that Mr. Durlav Chowdhury a student of M. Pharm. 4th Semester (Pharmacology) of this Institute has submitted his thesis entitled "THE ROLE OF CENTRAL HISTAMINERGIC TRANSMISSION IN THE HEPATIC ENCEPHALOPATHY INDUCED BEHAVIORAL DESPAIR IN RATS" under my supervision for the partial fulfillment of Master of Pharmacy in Pharmacology.

I hereby forward his thesis for the award of M.PHARM. (Pharmacology) during the academic session 2022-23.

> Dr. Nishant S. Jain Assistant Professor (Pharmacology)



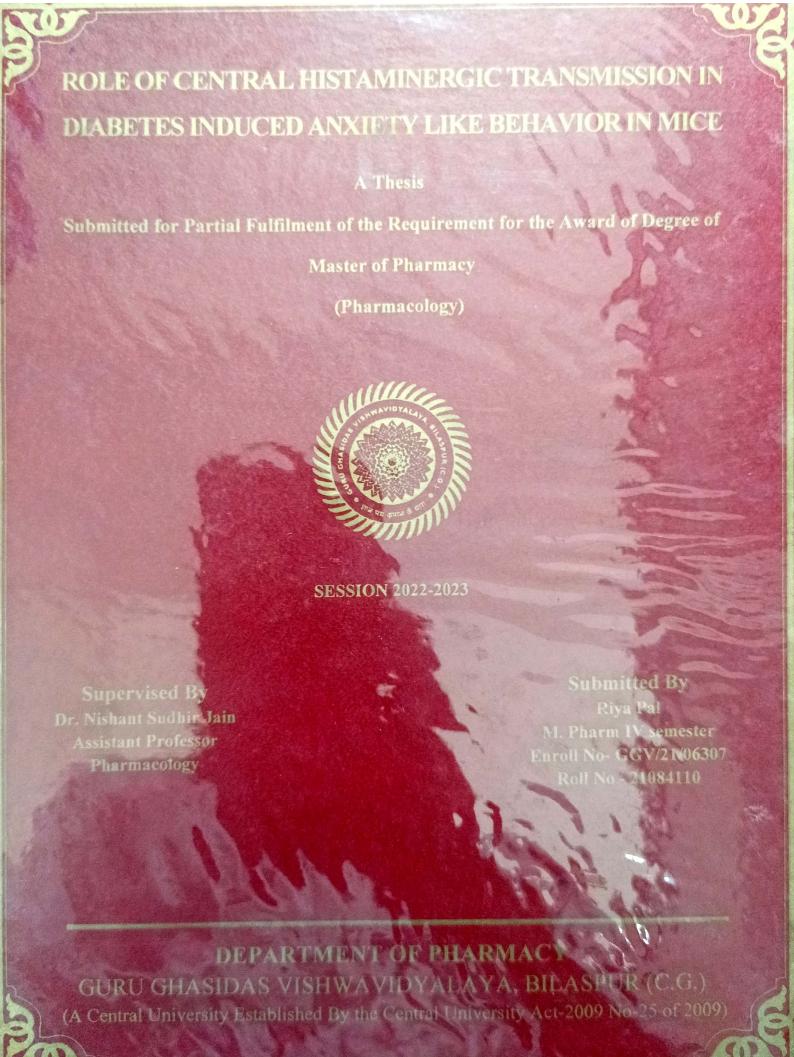
Sl.	Title					
No.			No.			
1	Introd	luction	1-9			
	1.1	Hepatic Encephalopathy (HE)	01			
	1.2	Pathophysiology of HE	02			
	1.3	Role of Ammonia in HE	03			
	1.4	Neuroinflammation and Hepatic Encephalopathy	04			
	1.6					
	1.7					
	1.8					
	1.9					
2	Litera	iture Review	10-12			
3	Aim	& Objective	13			
4	Mater	rials and Methods	14-28			
	4.1	4.1 Animals				
	4.2	.2 Drugs and Solutions				
	4.3	Intracerebroventricular Cannulation (I.C.V.)	15			
	4.4	Behavioral Tests	15			
		4.4.1 Tail Suspension Test	15			
		4.4.2 Locomotor Activity or Actophotometer	15			
	4.5	Experimental Design	16-18			
		4.5.1 Induction of hepatic encephalopathy (HE)	16			
		4.5.2 Effect of central administration of histamine on behavioral despair in rats with HE	16			
		4.5.3 Effect of central administration of histamine precursor, L-histidine on behavioral despair in rats with HE	16			

	4.5.4	Effect of histamine H ₃ receptors inverse	17	
		agonist/antagonist, thioperamide in hepatic		
		encephalopathy-induced behavioral and biochemical		
		alterations in rats		
	4.5.5	Effect of histamine H ₁ receptors agonist/antagonist,	17	
		FMPH/cetirizine in hepatic encephalopathy-induced		
		behavioral and biochemical alterations in rats		
	4.5.6	Effect of histamine H2 receptors agonist/antagonist,	17	
		amthamine/ranitidine in hepatic encephalopathy-		
		induced behavioral and biochemical alterations in		
		rats		
4.6	Isolation	n of brain and liver for histopathological analysis	18	
4.7	Isolation	n of brain and liver for biochemical analysis	19	
4.8	Biocher	nical parameters		
4.9	Confirmatory tests for liver damage			
	4.9.1 SGOT, SGPT, and total bilirubin			
		A. SGOT determination	19	
		B. SGPT determination	20	
		C. Total bilirubin determination	20	
4.10	Blood N	NH ₃ Level	21	
4.11	Confirm	Confirmatory tests for HE induced neuroinflammation and		
	influence	uence of histamine analogs		
	4.11.1	Brain NH ₃ levels	21	
	4.11.2	Brain water Content test	21	
	4.11.3	DNA Fragmentation Assay	21	
4.12	Estimation of Histamine levels in the Brain homogenate by		22-23	
	ELISA			
4.13	Biocher	mical Parameters for oxidative stress and nitrates in	23-28	
	brain af	iter HE		
	4.13.1	Brain Superoxide dismutase (SOD)	23	
	4.13.2	Brain Catalase (CAT)	24	

		4.13.3	Brain Malondialdehyde (MDA)	25
		4.13.4	Brain Glutathione Peroxidase (GPx)	26
		4.13.5	Brain Reduced Glutathione (GSH)	27
		4.13.6	Estimation of Brain nitrite levels	28
	4.14	Statistic	al analysis	28
5	Resul	ts		29-58
	5.1.	Peripher	ral administration of TAA-induced biochemical	29-32
	3.1.		on in rats	
		5.1.1.	Effect of thioacetamide (TAA) on blood ammonia levels in experimental rats	29
		5.1.2.	Effects of thioacetamide (TAA) on SGOT levels in experimental rats' liver extract	30
-'		5.1.3.	Effects of thioacetamide (TAA) on SGPT levels in experimental rats' liver extract	31
		5.1.4.	Effects of thioacetamide (TAA) on total bilirubin levels in experimental Rats' liver extract	32
	5.2	Histological studies		33
		5.2.1	Histological studies of experimental rats' liver	33
	5.3	Histami	ne levels in the Brain homogenate	33
	5.4.		administration of Histaminergic agents on behavioral ochemical alteration in Hepatic Encephalopathy (HE)	34-47
		5.4.1	Central Histamine attenuates behavioral despair/motor toxicity in HE-rats	34
		5.4.2	Central administration of L-Histidine reversed the behavioral despair/motor toxicity in HE rats	36
		5.4.3	Histamine H ₁ R agonist, FMPH attenuated in behavioral despair /motor toxicity in HE rats	37

8	Conclusion			66
7	Sumn	Summary		
6	Discu	ssion		59-64
	5.6. Histological studies of experimental rats' brain		55-58	
		5.5.6	Influence of histaminergic drugs on Brain Nitrite levels after HE	53
		5.5.5.	Influence of histaminergic drugs on Brain lipid peroxidation (MDA) levels after HE	52
		5.5.4.	Influence of histaminergic drugs on Brain Glutathione reductase (GSH) levels after HE	51
		5.5.3.	Influence of histaminergic drugs on Brain Glutathione peroxide (GP _x) levels after HE	50
		5.5.2.	Influence of histaminergic drugs on Brain Superoxide dismutase (SOD) levels after HE	49
		5.5.1.	Influence of histaminergic drugs on Brain Catalase (CAT) levels after HE	48
	5.5.	5.5. Effects on antioxidant systems		48-54
		5.4.10	Effects of all treatments on Percent (%) DNA fragmentation	47
			content induced by HE	
		5.4.9	level after HE Effects of all treatments on Percent (%) Brain water	45
		5.4.8	Influence of histaminergic drugs on brain ammonia	44
		5.4.7	Effect of H ₃ R inverse agonist/antagonist in depression/motor toxicity in HE rats	43
		5.4.6	Effect of H ₂ R antagonist on behavioral alterations/motor toxicity in HE rats	41
		5.4.5	Effect of H ₂ R agonist in behavioral despair/motor toxicity in HE-rats	39
			Effect of H ₁ R antagonist in behavioral alterations in HE rats	38

9	References		67-78
10	Appendices	7	79-80



ROLE OF CENTRAL HISTAMINERGIC TRANSMISSION IN DIABETES INDUCED ANXIETY LIKE BEHAVIOR IN MICE

A Thesis

Submitted for Partial Fulfilment of the Requirement for the Award of Degree of

Master of Pharmacy

(Pharmacology)



SESSION 2022-2023

Supervised By

Dr. Nishant Sudhir Jain Assistant Professor Pharmacology Submitted By

Riya Pal M. Pharm IV semester Enroll No- GGV/21/06307 Roll No - 21084110

DEPARTMENT OF PHARMACYGURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established By the Central University Act-2009 No-25 of 2009)

(A Central University Established By the Central University Act-2009 No-25 of 2009) Tel. No. 07752-260027, Fax No. 07752-260148

FORWARDING CERTIFICATE

This is to certify that Ms. Riya Pal, D/o. Mr. Sanjoy Pal a student of M. Pharm. IV Semester (Pharmacology) of this Institute has submitted her thesis work entitled "ROLE OF CENTRAL HISTAMINERGIC TRANSMISSION IN DIABETES INDUCED ANXIETY LIKE BEHAVIOR IN MICE" for the partial fulfilment of the recruitment of Master of Pharmacy in Pharmacology with her truly and honesty observed interference during her project work. She was completed her project work under the supervision of Dr. Nishant Sudhir Jain (Assistant Professor). Her work is original, satisfactory and is not submitted anywhere else for the award of any degree.

I hereby forward her thesis for the award of M. Pharmacy (Pharmacology) during the academic session 2022-2023.

Prof. Bharti Ahirwar

Head)

Department of Pharmacy
Guru Ghasidas Vishwavidyalaya
(A Central University)
Bilaspur (C.G.)

(A Central University Established By the Central University Act-2009 No-25 of 2009) Tel. No. 07752-260027, Fax No. 07752-260148

CERTIFICATE

This is to certify that Ms. Ríya Pal, D/o. Mr. Sanjoy Pal a student of M. Pharm. IV Semester (Pharmacology) of this Institute has submitted her thesis work entitled "ROLE OF CENTRAL HISTAMINERGIC TRANSMISSION IN DIABETES INDUCED ANXIETY LIKE BEHAVIOR IN MICE" for the partial fulfilment of the recruitment of Master of Pharmacy in Pharmacology with her truly and honesty observed interference during her project work. She was completed her project work under the supervision of Dr. Nishant Sudhir Jain (Assistant Professor). Her work is original, satisfactory and is not submitted anywhere else for the award of any degree.

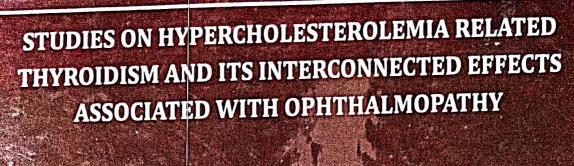
I hereby forward her thesis for the award of M. Pharmacy (Pharmacology) during the academic session 2022-2023.

Supervisor

Dr. Nishant Sudhir Jain Assistant Professor (Pharmacology)

CONTENTS

SR.NO.	TOPIC	PAGE NO.
1.	INTRODUCTION	1-19
2.	LITERATURE REVIEW	20-22
3.	AIMS AND OBJECTIVES	23
4.	MATERIAL AND METHOD	24-34
5.	RESULTS	35-49
6.	DISCUSSION	50-53
7.	SUMARRY & CONCLUSION	54
8.	REFERENCE	55-63



A THESIS SUBMITTED FOR

PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE

DEGREE OF

MASTER OF PHARMACY (PHARMACOLOGY)

(Session 2022-23)
THE SCHOOL OF STUDIES OF NATURAL RESOURCES

GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

A central University Established by Central Universities Act., 2009 No.25 of 2009)



BY

ANANTIKA RAHI

Under the supervision of

Dr. SURENDRA H. BODAKHE

Professor (Pharmacology)

DEPARTMENT OF PHARMACY GURU GHASIDAS VISHWAVIDYALAYA
(A Central University) BILASPUR (C.G.) INDIA

STUDIES ON HYPERCHOLESTEROLEMIA RELATED THYROIDISM AND ITS INTERCONNECTED EFFECTS ASSOCIATED WITH OPHTHALMOPATHY

A

THESIS

SUBMITTED FOR

PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF PHARMACY

(Session 2022-23)

IN THE SCHOOL OF STUDIES OF NATURAL RESOURCES

TO

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by Central Universities Act., 2009 No.25 of 2009)



BY

ANANTIKA RAHI

Under the supervision of

Dr. SURENDRA H. BODAKHE

Professor (Pharmacology)

DEPARTMENT OF PHARMACY GURU GHASIDAS VISHWAVIDYALAYA (A Central University) BILASPUR (C.G.) INDIA



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

: +91-775 2-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

FORWARDING CERTIFICATE

This is to certify that M/s Anantika Rahi D/o. Mr. Hemant Rahi, student of M.Pharm (Pharmacology) in Department of Pharmacy has submitted her thesis entitled "Studies on hypercholesterolemia related thyroidism and its interconnected effects associated with ophthalmopathy." for the partial fulfilment of the requirement of Master of Pharmacy (Pharmacology) with her truly and honesty observed inference during his project work. She has completed his project work under the supervision of Dr. Surendra H. Bodakhe (Professor, Pharmacology). Her work is original, satisfactory and is not submitted anywhere else for the award of any degree.

I hereby forward his thesis for the award of M. Pharmacy (Pharmacology) during the academic session 2022-23.

Forwarded by

Prof. Bharti Ahirwar

(H.O.D) Head

Department of Pharmacy Guru Ghasidas Vishwavidyalaya (A Central University) Bilaspur (C.G.)



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

: +91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

CERTIFICATE

This is to certify that M/s Anantika Rahi D/O. Mr. Hemant Rahi, student of M.Pharm (Pharmacology) in Department of pharmacy has submitted his thesis entitled "Studies on hypercholesterolemia related thyroidism and its interconnected effects associated with ophthalmopathy" for the partial fulfilment of the requirement of Master of Pharmacy (Pharmacology) with her truly and honesty observed inference during her project work. She has completed her project work under my supervision. Her work is original, satisfactory and is not submitted anywhere else for the award of any degree.

I hereby forward her thesis for the award of M. Pharmacy (Pharmacology) during the academic session 2022-23.

Pr. Surendra H. Bodakhe Professor (pharmacology) (Supervisor)



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

: +91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

DECLARATION

hereby declare that this dissertation work entitled "Studies on hypercholesterolemia related thyroidism and its interconnected effects associated with ophthalmopathy" is prepared under the guidance of Dr. Surendra H. Bodakhe, Professor, Department of pharmacy, Bilaspur (C.G.) for the partial fulfilment of the requirement of Master of Pharmacy (Pharmacology).

I further declare that I have not submitted this thesis previously for the award of any degree or diploma to me.

I would have to the as, all the noncember staff of the Repairs

a una leur met tier lenna en a beloved pare his sind fanelly, without

I would like to threat my teachers it.

tiest and as ped when it was required.

(Anantika Rahi)

Enrollment no: GGV/21/06301

M.Pharm , IV Semester

(Pharmacology)

2022-2023

ACKNOWLEDGEMENT

It gives me immense pleasure to thank all those who have helped me in the successful completion of this project.

I am speechless to the contribution of my esteemed guide Dr. Surendra H. Bodakhe, who has been the driving force behind my project. His deep involvement, dedicated support, kind nature, logical suggestion and encouragement to excel what I do and it's my fortune to work under his guidance.

I am thankful to Dr. Bharti Ahirwar (Head), Department of Pharmaceutical sciences, Guru Ghasidas Vishwavidyalaya for her timely words of advice, despite his busy schedule.

I would like to thank my teachers, Dr. K.P. Namdeo, Dr. Nishant S. Jain, Dr. Pradeep K. Samal, Dr. Shivani Rai Palliwal for the help that they provided me time to time and as and when it was required.

I would like to thank all the nonteaching staff of the department for their contribution and assistance.

I extend my heartfelt thanks to my friends Reshmee Yadav, KrishnaKant Jangde, who contributed in some or the other way for the success of this research work.

Last but not the least; my beloved parents and family, without whom I would ever be able to reach at this point. I shall remain devoted to them all of my life for their love, affection, encouragement, good wishes and blessings.

Anantika Rahi

INDEX

1. Contents	and the second s	
2. List of tables		II-IV
3. List of figures	Time years II. (Col. C	v-vIII
4. Abbreviations		IX-X

LIST OF TABLES

Table No.	Title	Page No.
2.1	Literature review	15-19
4.1	Experimental design for HCD induced thyrodism and its interconnected effects associated with ophthalmopathy.	24
5.1	Effects on lipid profile particularly (HDL, LDL)	37
5.2	Effects on thyroid profile	39
5.3	Effects on plasma level of oxysterol (27-OHC)	40
5.4	Effects on intraocular pressure (IOP)	42
5.5	Antioxidant levels of GSH, SOD on retinal tissue	44
5.6	Antioxidant levels of GSH, SOD on lens tissue	45-46
5.7	Effects on thyroid homogenate (.) GSH (B) SOD	47
5.8	Effects on retinal homogenate MDA and nitrite content	48
5.9	Effects on lens homogenate MDA and nitrite content.	50-51
5.10	Effects on thyroid homogenate MDA and nitrite content	52-53

CONTENTS

	The state of the s
*Topic	Page No.
lutroduction	1-12
Literature review	13-19
Aim and Objective	20
Material and methods	21-38
Results	39-125
Discussion and conclusion	126-142
Appendices	143-149
Annexures	150-152
	Literature review Aim and Objective Material and methods Results Discussion and conclusion Appendices



HEPATOPROTECTIVE ACTIVITY OF LATHYRUS SATIVUS LEAF EXTRACT IN PARACETAMOL INDUCED HEPATOTOXIC RATS

A

THESIS

SUBMITTED FOR

PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF PHARMACY (PHARMACOLOGY)

(Session 2021-23)

IN THE SCHOOL OF STUDIES OF NATURAL RESOURCES

TO

GURU GHASIDAS VISH WAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established by Central Universities Act., 2009 No.25 of 2009)



BY DIPENDRA NIRMALKAR

Under the supervision of

Dr. PRADEEP KUMAR SAMAL

Assistant Professor (Pharmacology)

Department of Pharmacy

Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.)

DEPARTMENT OF PHARMACY
GURU GHASIDAS VISHWAVIDYALAYA
(A Central University)
BILASPUR (C.G.)

INDIA



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

Tel: +91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

FORWARDING CERTIFICATE

This is to certify that this dissertation work entitled "Hepatoprotective Activity of Lathyrus sativus Leaf Extract in Paracetamol Induced Hepatotoxic Rats" work done by Mr. Dipendra Nirmalkar student of M. Pharm. IV Semester (Pharmacology) of this Institute has submitted his dissertation under the supervision and guidance of Mr. Pradeep Kumar Samal Assistant Professor (Pharmacology), in the partial fulfillment of the requirement for the award of Degree of Master of Pharmacy in Pharmacology.

I hereby forward his Dissertation for the award of M. Pharmacy (Pharmacology) during the academic session 2021-23.

Forwarded by

Prof. Bharti Ahirwar

(H&B)

Department of Pharmacy
Guru Ghasidas Vishwavidyala
(A Central University)
Bilaspur (C.G.)



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

Tel: +91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

CERTIFICATE

Hepatotoxic Rats" has been entirely carried out by Mr. Dipendra Nirmalkar M. Pharm. IV Semester (Pharmacology) student of this Institute under my supervision and guidance. The results incorporated in this dissertation have not been published by other researchers and it has not been submitted for any other degree in any other University. The dissertation is worthy of consideration for the award of degree of Master of Pharmacy in Pharmacology.

I hereby forward his Dissertation for the award of M. Pharmacy (Pharmacology) during the academic session 2021-23.

Supervisor

Mr. Pradeep Kumar Samal

Assistant Professor

(Pharmacology)

DECLARATION

I hereby declare that my M. Pharm. dissertation work entitled "Hepatoprotective etivity of Lathyrus sativus Leaf Extract in Paracetamol Induced Hepatotoxic Rats" is my wn work conducted under the supervision of Mr. Pradeep Kumar Samal Assistant Professor Pharmacology). The same is submitted to S.L.T. Institute of Pharmaceutical sciences, Guru hasidas Vishwavidyalaya, Bilaspur (C.G.) in partial fulfillment of the requirement for the begree of Master of Pharmacy in Pharmacology.

I further declare that to the best of my knowledge the dissertation does not contain any art of any work, which has been submitted for the award of any degree either in this niversity or in any other University/Deemed University without proper citation.

Dipendra Nirmalkar)

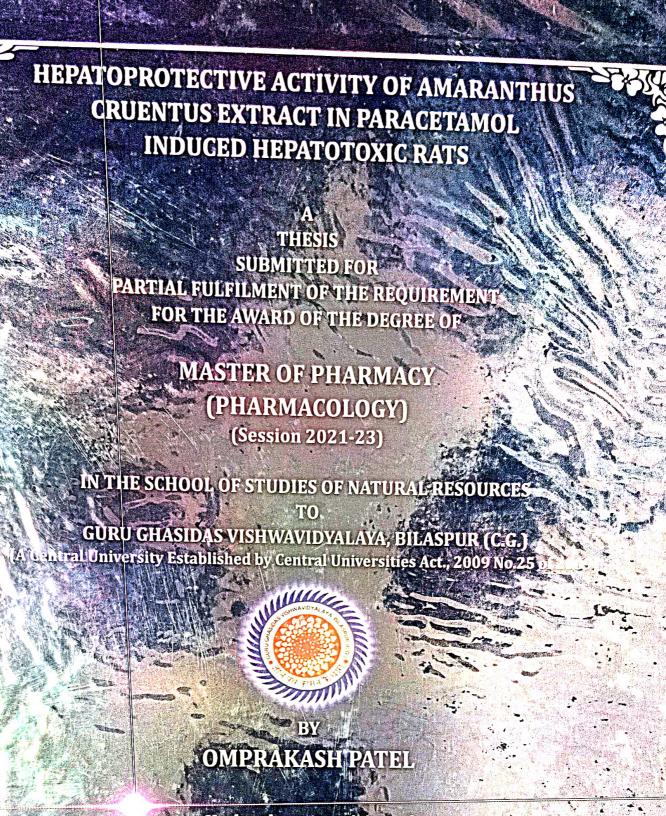
M.Pharm, IV Semester

(Pharmacology)

2021-2023

CONTENTS

(A)((Q)(A)(A)(A)(A)		1(1)	T BUNGAR
Chapter No.	er janet karaman en en klade. Historia	Topic	Page No.
1	ी किस्पूर्ण ज्याना प्रदेश	Introduction	1-15
2	13 Ag. 12 (1.5M	Plant Profile	16-18
3	, in active at 1.5	Literature review	19-20
4	THE OUT AT THE	Aim and Objectives	21
5		laterial and methods	22-40
6	SAF on Albertic	Results	41-62
7	trii na 407. 437	Discussion	63-64
8	St	mary and Conclusion	65
9		Appendices	66-70
10		References	71-75
11		Annexures	76



Under the supervision of

Dr. PRADEEP KUMAR SÄMAL

Assistant Professor (Pharmacology

Department of Pharmacy

Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur

CONTROL DEPARTMENT OF PHARMACY GURU GHASIDAS VISHWAVIDYALAYA (A Central University) BILASPUR (C.G.) INDIA

HEPATOPROTECTIVE ACTIVITY OF AMARANTHUS CRUENTUS EXTRACT IN PARACETAMOL INDUCED HEPATOTOXIC RATS

A

THESIS

SUBMITTED FOR

PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF PHARMACY (PHARMACOLOGY)

(Session 2021-23)

IN THE SCHOOL OF STUDIES OF NATURAL RESOURCES

TO

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established by Central Universities Act., 2009 No.25 of 2009)



BY OMPRAKASH PATEL

Under the supervision of

Dr. PRADEEP KUMAR SAMAL

Assistant Professor (Pharmacology)

Department of Pharmacy

Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.)

DEPARTMENT OF PHARMACY
GURU GHASIDAS VISHWAVIDYALAYA
(A Central University)
BILASPUR (C.G.)
INDIA



The description of the section 201 1-20.

DEPARTMENT OF PHARMACY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

Tel: +91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

FORWARDING CERTIFICATE

This is to certify that this dissertation work entitled "Hepatoprotective Activity of Amaranthus cruentus Extract in Paracetamol Induced Hepatotoxic Rats" work done by Mr. OMPRAKASH PATEL student of M. Pharm. IV Semester (Pharmacology) of this Institute has submitted his dissertation under the supervision and guidance of Mr. Pradeep Kumar Samal Assistant Professor (Pharmacology), in the partial fulfillment of the requirement for the award of Degree of Master of Pharmacy in Pharmacology.

I hereby forward his Dissertation for the award of M. Pharmacy (Pharmacology) during the academic session 2021-23.

I havely for word in Discordation in the award of M. Pittanian, differ complete deliver.

Forwarded by

Prof. Bharti Ahirwar
(H.O.D)



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

Tel: +91-7752-260 027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

CERTIFICATE

"Hepatoprotective Activity of Amaranthus cruentus Extract in Paracetamol Induced Hepatotoxic Rats" has been entirely carried out by Mr. OMPRAKASH PATEL M. Pharm. IV Semester (Pharmacology) student of this department under my supervision and guidance. The results incorporated in this dissertation have not been published by other researchers and it has not been submitted for any other degree in any other University. The dissertation is worthy of consideration for the award of degree of Master of Pharmacy in Pharmacology.

I hereby forward his Dissertation for the award of M. Pharmacy (Pharmacology) during the academic session 2021-23.

Supervisor

Mr. Pradeep Kumar Samal

Assistant Professor

(Pharmacology)

DECLARATION

AUDION FOR THE SECTION AND SECTION

I hereby declare that my M. Pharm. dissertation work entitled "Hepatoprotective Activity of Amaranthus cruentus Extract in Paracetamol Induced Hepatotoxic Rats" is my own work conducted under the supervision of Mr. Pradeep Kumar Samal Assistant Professor (Pharmacology). The same is submitted to Department of Pharmacy, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) in partial fulfillment of the requirement for the Degree of Master of Pharmacy in Pharmacology.

I further declare that to the best of my knowledge the dissertation does not contain any part of any work, which has been submitted for the award of any degree either in this University or in any other University/Deemed University without proper citation.

Cost had not the feath on because having have his many one the

Simply, without when I would exist be able to name at this paper if it is a recovery

March 2017 of the fire five Broke Suit afficialities compressionary paragraphic access and the contract of

Material Street Advantage The 181 to Copy on Pand and Supera in

and guidence devices excellent to line

Comprakash patel)

M.Pharm, IV Semester

(Pharmacology)

2021-2023

LIST OF FIGURES

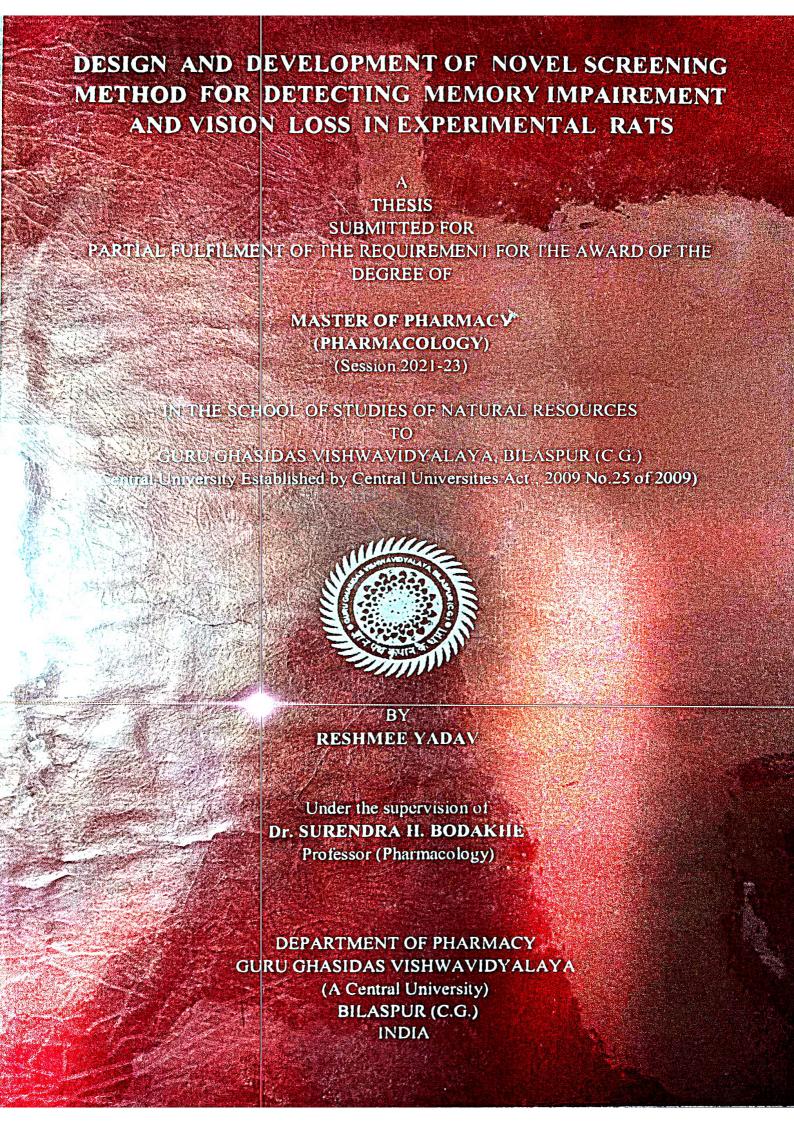
Figure number	Tille		
	Anatomy of liver		
1.2	Circulation of liver		
1.3	Cells of liver		
1.4	Acetaminophen induce hepatotoxicity		
2.1	Amaranthus cruentus		
2.2	Diagrammatic representation of pharmacological properties of Amaranthus cruentus due to its major active components		
5.1	Amaranthus cruentus		
5.2	Amaranthus cruentus for plant authentication		
5.3	Soxhlet apparatus with Amaranthus eruentus Extraet		
5.4	Methanolic extract of Amuranthus cruentus		
5.5	Preliminary phytochemical estimation		
5.6	Oral administration of drug via oral gavage		
5.7	Refrigerated centrifuge (Laby systems, India)		
6.1	GC-MS spectrum of Methanolic extract of Amaranthus eruentus		
6.2	GC-MS spectral analysis of Methanolic extract of Amaranthus cruentus		
6.3	Effect of MEAC on (A) ALT, (B) AST and (C) ALP level in paracetamol induced hepatotoxicity in rats		
6.4	Effect of MEAC on (D) TBL and (E) TP level in paracetamol induced hepatotoxicity in rats		
6.5	Effect of MEAC on (E), SOD (G) GPx and (H) GSH level in paracetamol induced hepatotoxicity in rats		
6.6	Effect of MFAC on (I) MDA level in paracetamol induced hepatotoxicity in rats		
6.7	Histopathology of liver		
9,1	Standard calibration curve of GSH by using pure GSH		
9.2	Standard campration curve of MDA by using tetramethoxypropans		
10.1	Animal Ethics Clearance Certificates from IAEC		
10.2	Plant authentication certificate		

CONTENTS

S. No.	C	ontents	Page number
1.	INTRODUCTION		1
2.	PLANT PROFILE		22
3.	LITERATURE REVIE	W	25
4.	AIM & OBJECTIVE		27
5.	METHOD & MATERI	AL	28
6.	RESULT		48
7.	DISCUSSION		67
8.	CONCLUSION		69
9.	APPENDICES		70
10.	REFERENCES		74
11.	ANNEXURES		78

CONTENTS

S. No.		Contents	Page number
1.	INTRODUCTION		1
2.	PLANT PROFILE		22
3.	LITERATURE REVI	EW	25
4.	AIM & OBJECTIVE		27
5.	METHOD & MATE	RIAL	28
6.	RESULT		48
7.	DISCUSSION		67
8.	CONCLUSION		69
9.	APPENDICES		70
10.	REFERENCES		74
11.	ANNEXURES		78



DESIGN AND DEVELOPMENT OF NOVEL SCREENING METHOD FOR DETECTING MEMORY IMPAIREMENT AND VISION LOSS IN EXPERIMENTAL RATS

A

THESIS

SUBMITTED FOR

PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTER OF PHARMACY (PHARMACOLOGY)

(Session 2021-23)

IN THE SCHOOL OF STUDIES OF NATURAL RESOURCES

TO

GURU GHASID AS VISHWAVIDYALAYA, BILASPUR (C.G.) (A Central University Established by Central Universities Act., 2009 No.25 of 2009)



BY RESHMEE YADAV

Under the supervision of

Dr. SURENDRA H. BODAKHE

Professor (Pharmacology)

DEPARTMENT OF PHARMACY
GURU GHASIDAS VISHWAVIDYALAYA
(A Central University)
BILASPUR (C.G.)
INDIA



(A Central University Established by Central Universities Act., 2009 No.25 of 2009)

+91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

FORWARDING CERTIFICATE

This is to certify that Miss. Reshmee Yadav D/o. Mr. Kameshwar Yadav, student of M.Pharm (Pharmacology) in Department of Pharmacy has submitted her thesis entitled "Design and development of novel screening method for detecting memory impairement and vision loss in experimental rats" for the partial fulfilment of the requirement of Master of Pharmacy (Pharmacology) with her truly and honesty observed inference during her project work. She has completed her project work under the supervision of Dr. Surendra H. Bodakhe (Professor, Pharmacology). Her work is original, satisfactory and is not submitted anywhere else for the award of any degree.

I hereby forward her thesis for the award of M. Pharmacy (Pharmacology) during the academic session 2022-22.

Forwarded by

Dr. Bharti Ahirwar

Head

Department of Pharmacy
Guru Ghasidas Vishwavidyala a
(A Central University)

Bilaspur (C.G.)



DEPARTMENT OF PHARMACY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.) (A Central University Established by Central Universities Act., 2009 No.25 of 2009)

+91-7752-260027 (O); +91-8827989653 (Mob); Fax: +91-7752-260148

CERTIFICATE

This is to certify that Miss. Reshmee Yadav D/o. Mr. Kameshwar Yadav, student of M.Pharm (Pharmacology) in Department of Pharmacy has submitted her thesis entitled "Design and development of novel screening method for detecting memory impairement and vision loss in experimental rats" for the partial fulfilment of the requirement of Master of Pharmacy (Pharmacology) with her truly and honesty observed inference during her project work. She has completed her project work under my supervision. Her work is original, satisfactory and is not submitted anywhere else for the award of any degree.

I hereby forward her thesis for the award of M. Pharmacy (Pharmacology) during the academic session 2022-23.

Dr. Surendra H. Bodakhe (Supervisor)

CONTENTS

Chapter No.	Topic	Page No.
1	Introduction	1-16
2	Literature review	17-22
3	Aim and Objective	-23
4	Material and methods	25-39
5	Results	40-67
i i nortusea et		(0.79
6	Discussion and Conclusion	69-78
7	Appendices	79-85
-8	Annexures	86-88
	24.73.4 (22.43.7)	

references and sopple of OSH level to the differ**ent experimental groups of**