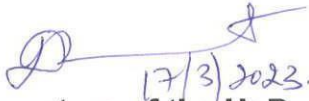


CERTIFICATE

I certify that the thesis entitled "*In vitro, in vivo and in silico approaches to assess the protective effect of Rosa indica petals on male infertility*" submitted for the award of **Doctor of Philosophy (Ph.D.)** by **Nithya.S** is the record of research work carried out by her during the period from January 2019 to March 2023 under my guidance and supervision, and that this work has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other Titles in this Institute or any other University or Institution of Higher Learning.


17/3/2023.

Signature of the HoD

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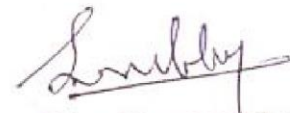

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Signature of Dean

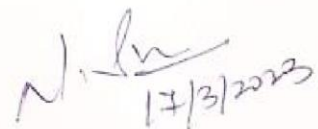
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DECLARATION

I declare that the thesis entitled "*In vitro, in vivo and in silico approaches to assess the protective effect of Rosa indica petals on male infertility*" submitted by me for the award of Doctor of Philosophy (Ph.D.) is the record of work carried out by me during the period from January 2019 to March 2023 under the guidance of **Dr. N. Santhi**, Assistant Professor, Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other Titles in this Institute or any other University or Institution of Higher Learning.



Signature of the Research Scholar



Signature of the Supervisor

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LIST OF ABBREVIATIONS

µg	microgram
µl	microlitre
µm	micrometer
µM	micromolar
µmol	micromole
AAS	Anabolic Androgenic Steroid
ABTS	2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)
ADME	Absorption, Distribution, Metabolism and Excretion
AL	<i>Asteracantha longifolia</i>
ANOVA	Analysis of Variance
APA	Advanced Paternal Age
ART	Assisted Reproductive Technology
ASIH	Anabolic Steroid Induced Hypogonadism
ATP	Adenosine Tri Phosphate
BMI	Body Mass Index
CAT	Catalase
CBAVD	Congenital Bilateral Absence of Vas Deference
CH	<i>Cardiospermum helicacabum</i>
COQ10	Coenzyme Q 10
DNA	Deoxyribonucleic Acid
DPPH	2,2-Diphenyl-2-Picryl Hydroxyl Hydrate
E2	Estradiol
ETC	Electron Transport Chain
EL	<i>Eurycoma longifolia</i>
FRAP	Ferric Reducing Ability of Plasma
FSH	Follicle Stimulating Hormone

g	Gram
GC-MS	Gas Chromatography and Mass Spectroscopy
GIFT	Gamete Intra Fallopian Transfer
GnIH	Gonadotropin Inhibitory Hormone
GnRH	Gonadotropin Releasing Hormone
GPx	Glutathione Peroxidase
GSH	Reduced glutathione (GSH)
GST	Glutathione-S-transferase
H ₂ O ₂	Hydrogen Peroxide
HADS	Hospital Anxiety and Depression Score
HMG	Human Menopausal Gonadotropin
HPA	Hypothalamus Pituitary adrenal
HPFSH	Highly Purified Follicle Stimulating Hormone
HPG	Hypothalamus-Pituitary-Gonadal
HPHMG	Highly Purified Human Menopausal Gonadotropin
HPTLC	High Performance Thin layer Chromatography
IAEC	Institutional Animal Ethics Committee's Clearance
IC ₅₀	Inhibitory concentration (causing 50% inhibition)
ICSI	Intra Cytoplasmic Sperm Injection
IUI	Intra Uterine Insemination
IVF	<i>Invitro</i> Fertilization
Kg	Kilogram
L	Litre
LAC	L Acetyl Carnitine
LC	L Carnitine
LH	Leutinizing Hormone

LPO	Lipid Peroxidation
MDA	Malondialdehyde
MESE	Microsurgical Epididymal Sperm Extraction
mg	milligram
min	minute
MOPS	(3-(N-morpholino) propanesulfonic acid)
MTT	3-(4,5-dimethylthiazol-2yl)-2,5-diphenyl tetrazolium bromide
NO	Nitric Oxide
NS	<i>Nigella Sativa</i>
OAT	Oligo Astheno Teratozoospermia
OH	Hydroxyl Radical
8- OHdG	8 hydroxy deoxy guanosine
OM	<i>Origanum majorana</i>
OS	Oxidative Stress
PDB	Protein Data Bank
PGD	Prenatal Genetic Diagnosis
POD	Peroxidase
PUFAs	Ply Unsaturated Fatty Acids
rFSH	Recombinant Follicle Stimulating Hormone
ROS	Reactive Oxygen Species
SA	<i>Syzygium aromaticum</i>
SD	Standard Deviation
SE	Selenium
SERMs	Selective Estrogen Receptor Modulators
SOD	Superoxide Dismutase
SVP	Sodium Valproate
T	Testosterone

TAC	Total Antioxidant Capacity
TBARS	Thiobarbituric acid
TESA	Testicular Sperm Aspiration
TESE	Testicular Sperm Extraction
TURED	Trans Urethral Resection of Ejaculatory Ducts
USG	Ultra Sonogram
UTI	Urinary Tract Infection
WHO	World Health Organization
ZN	Zinc