CERTIFICATE

I certify that the thesis entitled '**Unveiling the Anticariogenic Properties of Medicinal Plants and Development of a Polyherbal Dentifrice**' submitted for the award of **Doctor of Philosophy (Ph.D)** by **Gaayathiri Devi E** is the record of research work carried out by her during the period of study 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.

4/1/25

Signature of the
Head of the Department

4/1/2025

Signature of the Supervisor

4/1/2025

Signature of Dean

DECLARATION

I declare that the thesis entitled **'Unveiling the Anticariogenic Properties of Medicinal Plants and Development of a Polyherbal Dentifrice'** submitted by me for the award of **Doctor of Philosophy (Ph.D)** is the record of work carried out by me during the period of study under the guidance of **Dr. M. K. Nisha,** Assistant Professor (SS), Department of Botany, Avinashilingam Institute of Home Science and Higher Education For Women and has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship, Titles in this Institute or any other University or other similar Institution of Higher Learning.

7/1/2025

Signature of the Supervisor

Signature of the Research Scholar

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Gaayathiri Devi E

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LIST OF ABBREVIATIONS

AAR	*Achyranthes aspera root*
AB	*Acinetobacter baumannii*
ACE	Angiotensin-converting enzyme
AIL	*Acalypha indica leaves*
ALB	Albumin
APL	*Abrus precatorius leaves*
AZL	*Azadirachta indica leaves*
BCL	*Barleria cuspidata leaves*
BCL2	B-cell lymphoma 2
BHI	Brain Heart Infusion
BIC	Biofilm inhibitory concentration
CA	*Candida albicans*
CA4	Carbonic anhydrase-4
CA6	Carbonic anhydrase-6
CLSI	Clinical and Laboratory Standards Institute
CTD	Comparative Toxicogenomic Database
CTD	Comparative Toxicogenomic Database
DL	Drug-likeness
DMSO	Dimethyl sulfoxide
DOE	Design of Experiments
DPPH	2,2 - DiPhenyl-1-Picryl Hydrazyl
EHL	*Euphorbia hirta leaves*
ELISA	Enzyme-linked immunosorbent assay
EPSs	Extracellular polysaccharides
FBP	*Ficus benghalensis prop root*
GAE	Gallic acid equivalents
Gbp	Glucan Binding Protein
GC-MS	Gas Chromatography Mass spectrometry
GEO	Gene Expression Omnibus Database
Glide	Grid-based Ligand Docking with Energetics
GO	Gene ontology
gtfC	glucosyltransferase C

GTFs	Glucosyltransferases
KP	*Klebsiella pneumonieae*
IL1B	Interleukin 1-Beta
IMPPAT	A curated database of Indian Medicinal Plants, Phytochemistry, and Therapeutics
Intra HB	Intramolecular hydrogen bonding
IZD	Inhibitory zone diameter
$K_2Cr_2O_7$	Potassium dichromate
KEGG	Kyoto Encyclopaedia of Genes and Genomes
KRAS	Kirsten rat sarcoma virus
LB	Luria Bertani
MALDI-TOF MS	Matrix-assisted laser desorption ionization-time of flight mass spectrometry
MAPK	Mitogen-activated protein kinase
MATH	Microbial adhesion test to hydrocarbons
MBC	Minimum bactericidal concentration
MDR	Multi-drug resistant
MDS	Molecular dynamics simulation
MFC	Minimum Fungicidal Concentration
MIC	Minimum Inhibitory concentration
MMP	Matrix metalloproteinases
MODDE	Multivariate Data-driven Design and Engineering
MolSA	Molecular surface area
MS	Mean Squares
NaF	Sodium fluoride
ND	Not detected
NPT	No.of Particles, Pressure, and Temperature
NVT	No.of Particles, Volume, and Temperature
OEO1	*Origanum vulgare* L.
OEO2	*Origanum heracleoticum* L.
OPLS4	Optimized Potentials for Liquid Simulations
PA	*Pseudomonas aeruginosa*
PBL	*Piper betle leaves*
PGL	*Psidium guajava leaves*
PHDF	PolyHerbal DentiFrice

PLCS	Protein-ligand complex structure
PLS	Partial least squares
PPI	Protein-Protein Interaction
PPL	*Pongamia pinnata leaves*
PSA	Polar surface area
RCSB PDB	Research Collaboratory for Structural Bioinformatics Protein Data Bank
RE	Rutin equivalents
rGYr	Radius of gyration
RH	Relative humidity
RMSD	Root Mean Square Deviation
RMSF	Root Mean Square Fluctuation
SASA	Solvent accessible surface area
SD	Standard Deviation
SDA	Sabroud's Dextrose Agar
SEM	Scanning Electron Microscopy
SMILES	Simplified molecular input line entry specification
SMU	*Streptococcus mutans*
SOS	*Streptococcus oralis*
SPSA	*Streptococcus parasanguinis*
SS	Sum of Squares
SSA	*Streptococcus salivarius*
SSE	Secondary Structure Elements
SVF	*Solanum virginianum fruit*
TFC	Total Flavonoid Content
TGFB1	Transforming growth factor beta 1
TIP3P	Transferable Intermolecular Potential with 3 Points
TPC	Total Phenolic Content
TPL	*Tridax procumbens leaves*
USEPA	United States Environmental Protection Agency
WHO	World Health Organization
XP	Xtra Precision