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**M.Pharm [Pharmacology]** Students under taking **Project work**/Field work / Internship for the Academic Year 2023-2024.

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|---|---|
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| 2 | List of **M.Pharm [Pharmacology]** Students under taking Project work/Field work / Internship-HOI |
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| 2. | NITHYADEVI.P.<br>261621507509 | Dr.R.KANNAN | II | IN-SILICO,IN-VITRO AND IN-VITRO EVALUATION OF PHENOLIC COMPOUND IN<br>ETHYLENE GLYCOL INDUCED UROLITHIASIS MODEL ALBINO WISTAR RAT | - | - |
| 3. | V.SRINIVAS<br>261621507515 | Mr.G.MUTHUK UMARAN | II | NEUROPROTECTIVE EFFECT OF EXENATIDE IN 3-NITRO PROPIONIC ACID INDUCED HUNTINGTON DISEASE IN RATS | - | - |
| 4. | M.SHAFFUBTAJ<br>261621507513 | Dr.R.KANNAN | II | POTENTIAL ROLE OF POLYPHENOLS FOR THE TREATMENT OF POLYCSTIC OVARIAN SYNDROME IN LETROZOLE INDUCED RAT MODEL | - | - |
| 5. | R.RAJEEVGAN DHI<br>261261507511 | Dr.V.SURESH | II | EVALUATION OF NOOTROPIC ACTIVITY OF LIMONIA CRENULATA AGAINST SCOPOLAMINE INDUCED AMNESIA | - | - |

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| 7. | A.KISHORE JOSE 261621507505 | Mr.G.THAMOT HARAN | II | EVALUATION OF ANTIULCER ACTIVITY F ENSETE SUPERBUM CHEESM SEEDS ETHANOLIC EXTRACT | - | - |
| 8. | C.S.MUJEEBUD DIN 261621507508 | Mr.G.THAMOT HARAN | II | ANTIANXIETY AND ANTICONVULSANT ACTIVITY OF PHYLLANTHUS RETICULATUS: A NETWORK PHARMACOLOGY APPROACH | - | - |
| 9. | KRISHNA MOORTHI.K. 261621507506 | Mr.G.MUTHU KUMARAN | II | NEUROPROTECTIVE EFFECT OF CHITOSAN IN MPTP INDUCED PARKINSON DISEASE IN MICE | - | - |
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# EVALUATION OF NOOTROPIC ACTIVITY OF LIMONIA CRENULATA AGAINST SCOPOLAMINE INDUCED AMNESIA

***Dissertation submitted to***

THE TAMIL NADU Dr.M.G.R. MEDICALUNIVERSITY,

CHENNAI – 600 032.

***In partial fulfillment of the requirements for the award of the degree of***

MASTER OF PHARMACY

IN

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## CERTIFICATE

This is to certify that the dissertation work entitled **"EVALUATION OF NOOTROPIC ACTIVITY OF LIMONIA CRENULATA AGAINST SCOPOLAMINE INDUCED AMNESIA"** is the bonafide work carried out by **Mr.R.RAJEEVGANDHI, Reg. No.: 261621507511** under the guidance and supervision of **Dr.V.SURESH., M.Pharm.,Ph.D., Professor and Head**, JKKMMRF'S-Annai JKK Sampoorani Ammal College of Pharmacy, Komarapalayam.

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**Date:** 18.04.2024

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# RESULTS

**Parameters evaluate**

**Screening test:** Y maze, Locomotor activity **Biochemical:** AChE activity

**Histopathology:** Brain

| S No | Groupings | Alterations % | ACHE | Locomotor Activity | |
|---|---|---|---|---|---|
| | | | | Before | After |
| 1 | Control normal saline 1ml/kg i.p. | 58.00 ± 2.08 | 7.983 ± 0.14 | 215 ± 7.63 | 205 ± 6.65 |
| 2 | Scopalamine (1mg/kg i.p. | 28.00 ± 2.30 z, c | 34.92 ± 0.65 z | 213 ± 6.02 | 26.33 ± 4.91 z |
| 3 | Piracetam 200 mg/kg i.p.+ Scopalamine 1mg/kg i.p. | 72.33 ± 1.45 y, c | 11.00 ± 0.43 y,c | 193.66 ± 3.28 | 295 ± 8.66 x |
| 4 | MELC 200mg/kg p.o.+ Scopalamine 1mg/kg i.p. | 41.67 ± 2.02 y,c | 22.77 ± 0.42 z,c | 189.33 ± 6.35 | 215 ± 17.55 |
| 5 | MELC 400 mg/kg.p.o.+ Scopalamine 1mg/kg i.p. | 51.67 ± 2.02 c | 15.33 ± 0.36 z,c | 193.33 ± 4.40 | 226.66 ± 12.01 |

Values were expressed as mean ± SEM. x- p<0.05,y- p,0.01, z- p<0.001 were significantly compared with control group Vs all groups. a- p<0.05,b- p,0.01, c- p<0.001 compared with test groups Vs Scopalamine group

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# 8. CONCLUSION

*Limonia crenulate* has anti-cancer, anti-viral, anti-oxidant, anticancer, anti-bacterial, anti-fungal, and anti-plasmodium activities, and so they are used in many biomedical applications . It is used for the cure of a number of diseases such as diabetes, sore mouth, mouth ulcers, and leukemia. It produces about 130 alkaloids such as reserpine, vinceine, raubasin and ajmalcine. Anti-leukemic activity is shown by vinblastine and vincristine. Different parts of this plant produce different amounts of alkaloids, out of which root bark produces the maximum i.e. nearly 1.79%.

The memory activity of methanolic extract of *Limonia crenulate* by *in vivo* (Morris water maze and Y maze)method was evaluated Further studies can be carried out in the future to elucidate the other neurotransmitter are to evaluate and then mechanism of action, clinical studies may for carried out to establish its efficacy in humans

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# NEUROPROTECTIVE EFFECT OF CHITOSAN IN MPTP INDUCED PARKINSON DISEASE IN MICE

***Dissertation submitted to***

THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY,

CHENNAI-32.

***In partial fulfillment of the requirements***

***for the award of the degree of***

MASTER OF PHARMACY

IN

PHARMACOLOGY

***Submitted by***

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## DECLARATION

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# RESULTS

## SCREENING OF ANTIPARKINSONIAN ACTIVITY OF CHITOSAN:

## [MPTP MODEL]

## ROTA ROD TEST:

| Groups | Time spent on Rota rod (sec) | | |
|---|---|---|---|
| | Day 3 | Day 5 | Day 7 |
| Vehicle control | 178±0.57 | 179±1.48 | 178.67±0.95 |
| MPTP 25mg/kg | 74.667±1.33*** | 62±0.26*** | 61.333±0.18*** |
| MPTP 25mg/kg + Levodopa 12mg/kg | 59±2.02*** | 84.667±1.76*** | 120.67±0.59*** |
| MPTP 25mg/kg + CHITOSAN (200 mg/kg) | 47±1.52*** | 67±0.64*** | 94.667±0.72*** |
| MPTP 25mg/kg + CHITOSAN (400 mg/kg) | 53.333±2.40*** | 81±2.08*** | 111.67±0.14*** |

**Table 6**. Effect of chitosan on muscle grip strength

Statistical comparison: Each group (n=6), each value represents Mean ± SEM. One way Anova followed by Dunnett's test was performed. [a]P<0.001 denotes comparison of parkinsonic control with vehicle control and ns- non significant *P<0.05, **P<0.01, and ***P<0.001 denotes comparison of all groups with parkinsonic control.

# CONCLUSION

From the present study, it can be considered that the of **CHITOSAN** exhibited significant anti-parkinsonism activity in **MPTP** model in mice respectively. All the Parameters of Product treated group animals have shown better results when compared with MPTP induced group and the standard L-dopa treated group. These findings provide a preliminary-evidence for its potential as anti-parkinsonian medication, including Parkinson's disease prevention and improvement of symptoms

# PRECLINICAL EVALUATION OF *HIBISCUS CALYOPHYLLUS*. L IN THE TREATMENT OF UROLITHIASIS

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# CERTIFICATE

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# 7. RESULTS AND DISCUSSION

The herb *Hibiscus Calyphyllus*belonging to the family Malvaceae was selected for my project on the basis of Pharmacognostical, Phytochemical and ethanobotanical information which reveals uses against one of the most common disease

Literature survey reveals that not much work has been done on this herb claiming maximum therapeutic uses, so we felt worthwhile to claim for its therapeutic activity

## 7.1 PRELIMINARY PHYTOCHEMICAL ANALYSIS :

**Phytochemical analysis of AEHC**

**Table No: 2 - PhyochemicalAnalysis**

| S.No | Phytochemicals | Inference |
|---|---|---|
| 1 | Alkaloids | + |
| 2 | Carbohydrates | - |
| 3 | Glycosides | + |
| 4 | Fixed oil and fat | - |
| 5 | Tannins | + |
| 6 | Phenol | + |
| 7 | Triterpenoid | + |
| 8 | Saponin | + |
| 9 | Protein | + |
| 10 | Flavone and flavanoid | + |

+ Presenceofthecompound

- Absence of the compound

# 8. SUMMARY AND CONCLUSION

From the present study we conclude that the preliminary phytochemical analysis of *Hibiscus Cabyphyllus* indicated the presence of Alkaloids, Glycosides, Tannins, Saponins, Terpenoids, Phytosterols, Proteins and Flavonoids.

Urolithiasis can be produced in rats by induction of acute or chronic hyperoxaluria by using a variety of agents such as ethylene glycol, sodium oxalate, ammonium oxalate, hydroxyl-L-proline and glycolic acid. Kidney being the principal target for EG induced toxicity. EG is broken down *in-vivo* into four organic acids viz., glycolaldehyde, glycolic acid, glycooxalic acid and oxalic acid leading to hyperoxaluria which is the main initiative factor for lithiasis. Therefore in the present study, EG was preferred to induce lithiasis. Administration EG to the experimental animals for 28 days resulted in substantial elevation of oxalate and deposition of microcrystal's in kidney. In addition, oxalate precipitates as a calcium oxalate crystals in kidney since the oxalate metabolism is considered almost identical between rats and humans. Calcium and phosphate play a vital role in renal calculogenesis.

In EG induced rats, the urinary excretion of calcium, phosphate was significantly increased. The increase in calcium and phosphate excretion could be due to defective tubular reabsorption in the kidneys. While treatment with standard, curative and preventive regimens of *Hibiscus Calyophyllus* markedly reduced the levels of these ions, suggested protective effect of *Hibiscus Calyophyllus* urolithiasis. In urolithiasis, the calculi formed in the renal tissue leads to obstruction inthe urinary system that decreases the glomerular filtration rate (GFR) and cause an accumulation of certain products like bilary cholesterol, bilary phospholipids, bile acids, protein in urine, urea, creatinine and uric acid in the blood. Marked renal damage was seen in EG induced rats indicated by decreased GFR, significant kidney weight gain and elevated serum level of urea, creatinine, and uric acid.

However treatmentwith aqueous extracts of *Hibiscus Calyophyllus* leaves extracts in both curative and preventive regimens caused diuresis along with loss of kidney weight and also decreased the elevated serum level of , creatinine, uric acid and urea. The findings of the histopathological studies suggested that no microcrystalline deposition and deposition and kidney damage in the *Hibiscus Calyophyllus* extract treated groups all these observations enabled us to confirm the preventive curative

# ANTIDEPRESSANT EFFECT OF HYDROETHANOLIC EXTRACT OF *Croton hirtus* (HECH) IN MICE

The Tamil Nadu Dr. M.G.R. Medical University, Guindy, Chennai - 600 032

***In a partial fulfillment of the requirements for the award of degree of***

**MASTER OF PHARMACY**

(Department of Pharmacology)

***Submitted by***

**S. GOWTHAM**

Reg. No. 261621507503

***Under the guidance of***

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# 7. RESULTS AND DISCUSSION

## 7.1 PHYTOCHEMICAL ANALYSIS

The phytochemical analysis of Hydroethanolic extract of *Croton hirtus* shows the positive results for Alkaloids , Carbohydrates , Steroids , Glycosides and Terpenoids .

| S. NO | PHYTOCHEMICAL CONSTITUENTS | RESULT |
|---|---|---|
| 1 | Alkaloids | + |
| 2 | Carbohydrates | + |
| 3 | Reducing sugar | - |
| 4 | Flavanoids | + |
| 5 | Saponins | - |
| 6 | Tannins | - |
| 7 | Steroids | + |
| 8 | Proteins | - |
| 9 | Glycosides | + |
| 10 | Phenols | - |
| 11 | Amino acids | - |
| 12 | Terpenoids | + |

# 8. SUMMARY AND CONCLUSION

## SUMMARY

### 1. Phytochemical evaluation of Croton hirtus

The phytochemical studies were carried out for the hydroethanolic extract of Croton hirtus and the leaf shows positive results for Alkaloids , Carbohydrates , Steroids , Glycosides and Terpenoids.

### 2. In-Vivo Anti-depressant activity of Croton hirtus

The Behavioural assessments screening was carrired out and in tail suspension test the animal administered with HECH of 200 and 400 mg/kg shows reduction in frequency and duration of immobility when compared with the standard.

Forced swim test shows the immobility of animal with test drug HECH 200 and 400 mg/kg and latency of immobility is increased when compared to standard drug Imipramine 15 mg/kg.

### 3. In-vitro Anti-depressant activity of Croton hirtus

Estimation of reduced glutathione, estimation of catalase and estimation of total nitrate promotes the significant anti oxidant activity in animals treated with test drug when compared to the standard.

### 4. Biochemical analysis

Serum cortisone level was increased in the animals treated with test drug HECH 200 and 400 mg/kg and more significant than standard.

### 5. Histopathology of brain

Histopathology studies shows that the increased proliferation of cells and widening of molecular layers

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# NEUROPROTECTIVE EFFECT OF EXENATIDE IN 3–NITRO PROPIONIC ACID INDUCED HUNTINGTON DISEASE IN RATS.

***Dissertation submitted to***

**THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY,**

**CHENNAI-32.**

***In partial fulfillment of the requirements***

***for the award of the degree of***

**MASTER OF PHARMACY**

**IN**

**PHARMACOLOGY**

***Submitted by***


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# CHAPTER 7

# RESULTS

## Percentage inhibition of Exenatide on *in-vitro* AChE enzyme activity

Table No.1 *in-vitro* AChE inhibitory effect of Exenatide and Donezepil hydrochloride

| Concentration (µg/ml) | % Inhibition of AchE by Exenatide | % Inhibition of AchE by Donepezil hydrochloride |
|---|---|---|
| 6.25 µg/ml | 17.44±0.36 | 38.32±0.76 |
| 12.5 µg/ml | 39.11±0.45 | 69.35±0.41 |
| 25 µg/ml | 41.71±0.17 | 75.33±0.47 |
| 50 µg/ml | 50.26±0.21 | 76.16±0.14 |
| 100 µg/ml | 51.28±0.22 | 78.31±0.11 |
| 200 µg/ml | 53.19±0.25 | 83.41±0.15 |
| $IC_{50}$ value | 49.05µg/ml | 7.11µg/ml |

The values are expressed as mean ± SEM (n=3)

Both Exenatide and Donepezil hydrochloride produced a dose depend increase in *in-vitro* AChE inhibitory activity. Exenatide has shown 51.28±0.22% Inhibition at 100 µg/ml while Donepezil hydrochloride has shown 78.31±0.11% Inhibition at 100 µg/ml. $IC_{50}$ value of Exenatide and Standard donepezil against AChE was found to be 49.05µg/ml and 7.11µg/ml respectively.

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# CHAPTER 9

# CONCLUSION

In our findings, Exenatide showed significant results in *in vitro* acetylcholinesterase inhibition and *in vitro* free radical scavenging activity prompted us to select Exenatide for pharmacological screening. In this study, results of behavioural tests for motor coordination, agitated levels of acetylcholine level and SOD indicated that the 3-NPA lead to memory and learning problem and movement abnormalities in rats, which were found to be reversed by Exenatide when compared to Donepezil hydrochloride treated groups. These results indicated that Exenatide may be a potential candidate for 3- NPA induced brain damage which may be attributed to the presence of potent antioxidants in Exenatide. However, further extensive research is necessary to identify the exact constituents and elucidation of its possible mechanism of action underlying the anti-huntington effect of Exenatide. Such new findings may be included as strategies for more effective neuroprotection in addition to current therapies.


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# POTENT INHIBITORY EFFECT OF FLAVONOIDS ON INFLAMMATORY RESPONSE OF COLLAGEN INDUCED ARTHRITIS IN RAT

**Dissertation submitted to**

THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY,
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**In partial fulfillment of the requirements for the award of the degree of**

**MASTER OF PHARMACY**
**IN**
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# 6. RESULT AND DISCUSSION

## 6. *In Silico* Report for Rheumatoid Arthritis

### 6.1 Molecular Docking Studies Report

| Compound | Title | G_score | G_HBond | G_evdw | G_coul | G_energy | G_emodel |
|---|---|---|---|---|---|---|---|
| Orientin | 5281675 | -6.34 | -3.45 | -27.59 | -8.22 | -35.82 | -43.76 |
| Procyanidin | 107876 | -6.32 | -3.08 | -30.41 | -8.89 | -39.31 | -51.71 |
| Aloesin | 160190 | -5.87 | -3.16 | -22.69 | -6.42 | -29.12 | -34.49 |
| Baicalin | 64982 | -5.35 | -2.88 | -19.04 | -8.82 | -27.87 | -36.33 |
| Aloenin | 162305 | -5.14 | -2.32 | -26.58 | -8.86 | -35.44 | -41.31 |
| Aloe emodin | 10207 | -4.94 | -2.07 | -20.14 | -3.55 | -23.69 | -29.78 |
| Kaempferol-3-O-rutinoside | 5318767 | -4.88 | -3.69 | -26.85 | -14.29 | -41.14 | -46.12 |
| Baicalein | 5281605 | -4.87 | -2.4 | -18.62 | -7.65 | -26.27 | -31.92 |
| Theaflavanin | 1.35E+08 | -4.8 | -2.02 | -19.27 | -4.566 | -23.83 | -29.06 |
| Macluraxanthone | 5281646 | -4.67 | -1.92 | -18.48 | -9.254 | -27.73 | -34.38 |
| Aloin A | 12305761 | -4.65 | -1.9 | -20.46 | -6.29 | -26.75 | -32.43 |
| Psoralidin | 5281806 | -4.61 | -0.7 | -25.53 | -4.34 | -29.87 | -35.28 |
| Leucocyanidin | 71629 | -4.6 | -2.07 | -20.26 | -5.778 | -26.04 | -30.12 |
| Wogonin | 5281703 | -4.45 | -0.84 | -23.55 | -3.23 | -26.79 | -30.8 |
| Catechol | 289 | -4.35 | -1.92 | -10.16 | -6.58 | -16.75 | -18.65 |
| Kaempferol 3-neohesperidoside | 5318761 | -4.34 | -3.86 | -24.81 | -6.19 | -31 | -35.09 |
| Mauritianin | 10919701 | -4.33 | -3.57 | -33.17 | -4.817 | -37.99 | -40.75 |
| Epicatechin | 72276 | -4.3 | -1.62 | -16.64 | -8.52 | -25.16 | -27.9 |
| Broussonol E | 10343070 | -4.16 | -1.92 | -25.85 | -4.06 | -29.92 | -33.82 |
| Mangiferin | 5281647 | -4.09 | -1.92 | -25.66 | -4.45 | -30.11 | -36.01 |
| Glabridin | 124052 | -4.05 | -0.7 | -21.27 | -5.02 | -26.29 | -31.63 |
| Pectolinarigenin | 5320438 | -3.98 | -0.48 | -24.92 | -1.22 | -26.15 | -27.67 |
| Anacardic acid | 167551 | -3.7 | -2.02 | -16.49 | -9.76 | -26.25 | -27.89 |
| Biorobin | 15944778 | -3.67 | -3.35 | -23.07 | -10.97 | -34.09 | -40.56 |
| Hyperoside | 5281643 | -3.67 | -3.28 | -27.64 | -7.18 | -34.83 | -40.38 |
| Purpurin | 6683 | -3.61 | -0.96 | -20.9 | -0.21 | -21.12 | -24.2 |
| Cryptotanshinone | 160254 | -3.6 | 0 | -23.7 | -0.53 | -24.24 | -30.24 |
| Tanshinone I | 114917 | -3.59 | 0 | -21.49 | -0.17 | -21.67 | -27.68 |

# 7. SUMMARY AND CONCLUSION

## *In silico* studies

*In silico* studies was carried out using PDP ID 2AZ5 is retrieved from RCSB PDB. 2AZ5 is crystal structure of TNF-α with a small molecular inhibitor. Lignads are the natural products or secondary metabolites like flavonoids where downloaded from PubChem database. We conducted molecular docking by Glide model method for protein–drug interaction .The protein drug interaction value of range between -6.34kcal /mol to -0.76kcal /mol when compared to standard drug of rituximab -1.25 kcal/mol. additionally, we conduct MMGBSA assay for calculating the bound and unbound protein. The MMGBSA result shows range of -45.95 kcal/mol to -20.92. In ADMET screening studies, compounds are not showing toxicity. Finally, We concluded that based on *In silco* report and availability select the Kaempferol is best compound for further studies.

## *In vitro* studies

In vitro studies, we conducted protein denaturation inhibition assay. Kaempferol as test drug using at different concentration in this method. Rituximab as a standard drug using in protein denaturation inhibition assay. PH was adjusted to 6.3 to all above solution by using 1N HCl. sample solution was incubated at 37°C for 20 minutes. The absorbance of the resulting solution is measured at 416 n m using UV visible spectrophotometer. The Percentage inhibition of protein denaturation was calculated. *In vitro* anti-rheumatoid activity was evaluated by using red blood cells (RBC) membrane stabilization method. Goat RBCs was used for the study of membrane stability. In this study, Supernatant was tested for hemoglobin content at 560 nm using a UV-Visible spectrophotometer. The percentage of RBC membrane stabilization was calculated.

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# *TO EVALUVATE INVITRO* ANTICANCER AND ANTIOXIDANT ACTIVITIES OF WHOLE PLANT OF *VITEX ALTISSIMA* EXTRACT AGAINST MCF—7 CELL LINES.

**A Dissertation submitted to**

**The Tamil Nadu Dr.M.G.R. Medical University,**

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**In partial fulfilment of the requirements for the award of the degree of**

MASTER OF PHARMACY

IN

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This is to certify that the dissertation work entitled "To evaluate invitro anticancer and antioxidant activities of whole plant of vitex altissima extract against mcf—7 cell lines "is the bonafide work carried out by, **Mr.KARTHIKA RAMESH (Reg. No. 261620507508),** under the guidance and supervision of **Dr.V.SURESH., M.Pharm., Ph.D** ., Professor and Head, Department of Pharmacolog., JKKMMRF's Annai JKK Sampoorani Ammal College of Pharmacy, Komarapalayam.

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# DECLARATION

I hereby declare that this dissertation entitled " To evaluvate invitro anticancer and antioxidant activities of whole plant of vitex altissima extract against mcf—7 cell lines is based on the original work carried out by me under the guidance and supervision of Dr.V.SURESH ., M.Pharm ., Ph.D., Professor and Head , Department of Pharmacology ., JKKMMRF 's Annai JKK Sampoorani Ammal College of Pharmacy, Komarapalayam ., for submission to TheTamilnadu Dr.M.G.R Medical University, Chennai in the partial fulfillment for the degree of **MASTER OF PHARMACY** in Pharmacology. This work is original and has not been submitted in part or full for the award of any other degree or diploma ofany other university. The information furnished in this dissertation is genuine to the best of my knowledge and belief. I further declare that this work has not been submitted earlier in part or full for the award of any degree or diploma to this or any other university

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# DISCUSSION & CONCLUSION

## Discussion

The present study has demonstrated that the ethanol extract of Vitex altissima possesses significant anticancer and antioxidant activities. The extract exhibited cytotoxic activity against human breast cancer MCF-7 cells with an IC50 value of 70.23 mg/ml. Additionally, the extract exhibited potent antioxidant activity, with an IC50 value of 25 µg/ml in the DPPH radical scavenging assay. These findings are consistent with previous studies that have reported the anticancer and antioxidant activities of Vitex altissima extracts.

For instance, a study by Park et al. (2012) found that the ethanol extract of Vitex altissima exhibited cytotoxic activity against human cervical cancer HeLa cells, with an IC50 value of 54.5 µg/ml. Similarly, a study by Lee et al. (2013) found that the methanol extract of Vitex altissima exhibited antioxidant activity in the DPPH radical scavenging assay, with an IC50 value of 27.5 µg/ml.

The anticancer activity of Vitex altissima may be attributed to the presence of various bioactive compounds, such as vitexin, apigenin, and luteolin. These compounds have been shown to possess antiproliferative, proapoptotic, and anti-inflammatory activities in cancer cells. Vitexin, for example, has been shown to induce apoptosis in human lung cancer cells (Kim et al., 2015). Apigenin has been shown to suppress tumor growth in mice with colon cancer (Tanaka et al., 2011). Luteolin has been shown to inhibit angiogenesis, which is a process that is essential for tumor growth and metastasis (Huang et al., 2012).

The antioxidant activity of Vitex altissima may be attributed to the presence of phenolic compounds, such as tannins and flavonoids. These compounds have been shown to scavenge free radicals, which are molecules that can damage cells and DNA. Tannins, for example, have been shown to protect against oxidative stress-induced DNA damage (Sako et al., 2003). Flavonoids have been shown to inhibit lipid peroxidation, which is a process that can damage cell membranes (Sies et al., 2005).

# CONCLUSION

The present study has provided further evidence for the anticancer and antioxidant activities of Vitex altissima. The extract exhibited cytotoxic activity against human breast cancer MCF-7 cells and potent antioxidant activity. Vitex altissima could be a potential source of natural anticancer and antioxidant agents. Further research is needed to fully elucidate the therapeutic potential of the extract and its bioactive compounds.

# *IN-SILICO*, *IN-VITRO* AND *IN-VIVO* EVALUATION OF PHENOLIC COMPOUND IN ETHYLENE GLYCOL INDUCED UROLITHIASIS MODEL ALBINO WISTAR RAT

The Tamil Nadu Dr. M.G.R. Medical University, Guindy, Chennai - 600 032

***In a partial fulfillment of the requirements for the award of degree of***

MASTER OF PHARMACY

(Department of Pharmacology)


***Submitted by***

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I hereby declared that this dissertation entitled **"IN-SILICO, IN-VITRO AND IN-VIVO EVALUATION OF PHENOLIC COMPOUND IN ETHYLENE GLYCOL INDUCED UROLITHIASIS MODEL ALBINO WISTAR RAT"** is a bonafide work carried out by me under the guidance and supervision of **Dr.KANNAN.R, M.Pharm, Ph.D.**, Associate Professor, Department of Pharmacology, JKKMMRF'S-Annai JKK Sampoorani Ammal College of Pharmacy, Komarapalayam submitted to The Tamilnadu Dr. M.G.R Medical University-Chennai in partial fulfillment and requirement of university rules and regulation for the award of Degree Master of Pharmacy in Pharmacology during the academic year 2023-2024.

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# 7. SUMMARY AND CONCLUSION

## 7.1 SUMMARY

### *IN-SILICO* STUDY

- We selected Flavnoids /poly phenolic compounds as ligand .Obtained from Pubchem/Super nature. Selection of PDB ID-2ETE Retrieved from RCSB PDB
- Molecular docking performed by Schrodinger suit 2023-Result showing G-Score -7.3
- MMGBSA- Binding free Energy Calculation Performed prime module ;Result showing Range -35.27 Kcal/Mol,(Range between -55.22 -15.15 Kcal/Mol)

### *IN-VITRO STUDY*

- Neucleation assay Crystal growth assay and aggregation assay Result to increasing inhibit the calcium oxalate crystal,When compare to the Commercial available Standard drug Cystone

### *IN-VIVO* STUDY

- We divided in 5 Group, inducing agent-ethylene glycol 0.75%v/v, Standard-Cystone 750mg/kg, Test –Hesperidin 200mg,400mg/kg Value expressed as means compare the control
- Urine Volume-when compare to standard and test,naegative control ethylene glycol 0.75% v/v administered animal urine output decrease
- PH When compare to standard cystone and low dose Hesperidin 200mg,400mg/kg and cystone 750mg/kg increasing urine ph 6.0-7.5 compare to the standard
- Serum parameters
- Calcium level ethylene glycol 2.6mg/dl when compare control test and standard satisfactory report

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Group 1 normal renal parenchyma

Group 2 oxlate stone tubular present

Group 3 standard mild renal degradation

Group 4 Hesperidin200 mg glomerular Atrophy dilation

Group 5 Re de generalized normal glomerular structure

## 7.2 CONCLUSION

- The anti-urolithiatic effect of Hesperidine is attributed to its antioxidant nature which prevents oxidative stress induced by ethylene glycol, thus preventing renal calculi formation.
- The prevention of oxidative stress and the use of natural antioxidants are potential agents for the prevention of kidney stone formation.
- Therefore, ferulic acid is a potential drug candidate with strong pharmacological effect against kidney stone-related ailments. However, there is need for further studies to elucidate the detailed mechanism involved in the mitigation of urolithiasis by Hesperidine .

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# NEPHROPROTECTIVE EFFECT OF AQUEOUS EXTRACT OF *Pimpinella heyneana* IN GENTAMICIN INDUCED NEPHROTOXICITY IN RATS

**Dissertation submitted to**

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**In partial fulfilment of the requirements for the award of the degree of**

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**Submitted by**


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# 8. CONCLUSION

Nephrotoxicity is a common clinical syndrome defined as a rapid decline in renal function resulting in abnormal retention of serum creatinine and blood urea, which must be excreted. There are few chemical agents to treat acute renal failure.

Studies reveal back synthetic nephroprotective agents have adverse effect besides reduce nephrotoxicity. There is a growing interest of public in traditional medicine, particularly in the treatment of nephrotoxicity partly because of limited choice in the pharmacotherapy.

Many plants have been used for the treatment of kidney failure in traditional system of medicine throughout the world. Indeed along with the dietary measures, plant preparation formed the basis of treatment of disease until the introduction of allopathic medicine.

Ethnomedicinal plants can be used to help forestall the need of dialysis by treating the causes and effect of renal failure, as well as reducing the many adverse effect of dialysis.

In present study, the rats treated with single dose of gentamycin shown marked reduction of body weight as compared to normal group also caused a marked reduction of glomourular filtration rate, which is accompanied by increase in serum creatinine level and declain in creatinine clearence indicating induction of acute renal failure.241 with *Pimpinella Heyneana* at the dose level of 200 and 400 mg/kg body weight for 15 days significantly lowered the serum level of creatinine with a significant weight gain, increased urine output and creatinine clearence when compared with the nephrotoxic control group.

Gentamycin administration to control rats produced a typical pattern of nephrotoxicity which was manifested by marked increase in serum blood urea nitrogen (BUN). *Pimpinella Heyneana* supplementation to Gentamycin treated rats recorded decrement in levels of blood urea nitrogen (BUN) in plasma.

Decrement in activity levels of renal Superoxide dismutase (SOD) and Catalase (CAT) following Gentamycin treatment are in accordance with previous report on Gentamycin induced suppression of endogenous enzymatic antioxidant machinery. *Pimpinella Heyneana* treatment efficiently prevented Gentamycin induced decrease in

activity levels of superoxide dismutase (SOD) and Catalase (CAT). 242 A relationship between nephrotoxicity and oxidative stress has been confirmed in many experimental models.

Based on the above results, it was concluded that *Pimpinella Heyneana* exerted statistically significant Nephroprotective activity against Gentamycin induced Nephrotoxic rats.


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# ANTIDEPRESSANT EFFECT OF HYDROETHANOLIC EXTRACT OF *Croton hirtus* (HECH) IN MICE


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***In a partial fulfillment of the requirements for the award of degree of***

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**(Department of Pharmacology)**

***Submitted by***

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# 8. SUMMARY AND CONCLUSION

## SUMMARY

### 1. Phytochemical evaluation of Croton hirtus

The phytochemical studies were carried out for the hydroethanolic extract of Croton hirtus and the leaf shows positive results for Alkaloids , Carbohydrates , Steroids , Glycosides and Terpenoids.

### 2. In-Vivo Anti-depressant activity of Croton hirtus

The Behavioural assessments screening was carrired out and in tail suspension test the animal administered with HECH of 200 and 400 mg/kg shows reduction in frequency and duration of immobility when compared with the standard.

Forced swim test shows the immobility of animal with test drug HECH 200 and 400 mg/kg and latency of immobility is increased when compared to standard drug Imipramine 15 mg/kg.

### 3. In-vitro Anti-depressant activity of Croton hirtus

Estimation of reduced glutathione, estimation of catalase and estimation of total nitrate promotes the significant anti oxidant activity in animals treated with test drug when compared to the standard.

### 4. Biochemical analysis

Serum cortisone level was increased in the animals treated with test drug HECH 200 and 400 mg/kg and more significant than standard.

### 5. Histopathology of brain

Histopathology studies shows that the increased proliferation of cells and widening of molecular layers

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## CONCLUSION

- In conclusion the hydroethanolic extract of croton hirtus shows the beneficial activity similar to the standard drug Imipramine in treatment of depression.
- The test drugs promotes the antioxidant activity like free radical scavenging and thereby treats the cause of depression.
- Croton hirtus also promotes the other pharmacological activities like Diabetes, in lowering of blood cholesterol levels, Gastro intestinal disturbances and Hepatic disturbances.
- C. hirtus can be considered as a valuable source of pharmacologically active agents and used for designing phytomedicines.
- The present study provides the first evidence indicates the Hydroethanolic extract of croton hirtus showed significant anti depressant activity in tail suspension test and forced swim test .
- The study carried out the next level of research is required to know the mechanism of it is action and targetted.
- Nonetheless, further investigations are essential to elucidate the mode of action of the antioxidant and the enzyme inhibition activity, toxicity, safety, and bioavailability of the extracts.

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# ANTIANXIETY AND ANTICONVULSANT ACTIVITY OF *PHYLLANTHUS RETICULATUS*: A NETWORK PHARMACOLOGY APPROACH.

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***In partial fulfillment of the requirements***

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**IN**

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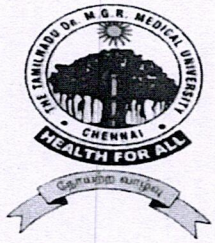


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## DECLARATION

I hereby declare that this dissertation entitled **"ANTIANXIETY AND ANTICONVULSANT ACTIVITY OF *PHYLLANTHUS RETICULATUS*: A NETWORK PHARMACOLOGY APPROACH"** is a bonafide work carried out by me under the guidance and supervision of **Mr. G. THAMOTHARAN, M.Pharm., (Ph.D).**, Associate Professor, in Department of Pharmacology, JKKMMRF'S – Annai JKK Sampoorani Ammal college of Pharmacy, Komarapalayam submitted to The Tamilnadu Dr. M.G. R Medical University-Chennai in partial fulfillment and requirement of university rules and regulation for the award of Degree Master of Pharmacy in Pharmacology during the academic year 2023-2024.

I further declare that this work is original and has not been submitted to this dissertation previously for the award of any degree.

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# 7.CONCLUSION

The results of the current study reveal that phytoconstituents can serve as excellent candidates in the management of epilepsy and anxiety by modifying the functions of GABA receptors. Further in vivo studies using animal models are required to confirm the therapeutic potential of the havetrichoside c in the prevention and treatment of epilepsy and anxiety.


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# EVALUATION OF ANTIULCER ACTIVITY OF *ENSETE SUPERBUM* CHEESM SEEDS ETHANOLIC EXTRACT

**The Tamil Nadu Dr. M.G.R. Medical University, Guindy, Chennai - 600 032**

***In a partial fulfillment of the requirements for the award of degree of***

**MASTER OF PHARMACY**

**(Department of Pharmacology)**

***Submitted by***

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# 8.SUMMARY AND CONCLUSION

The present project is to explain the anti-ulcer and anthelmintic activities of the ethanolic extract of *Ensete Superbum* seeds.

The ethanolic extract of *Ensete Superbum* seeds are tested orally at the doses of 100 mg/kg and 200 mg/kg for treating gastric ulcerations that induced by Pylorus ligation.

The preliminary phytochemical screening of the ethanolic extract of *Ensete Superbum* seeds showed the presence of alkaloids, carbohydrates, glycosides, sterols, flavonoids, saponins, tannins, triterpenoids and proteins. The flavonoids, tannins and triterpenoids are the possible constituents behind the anti-ulcer activity of *Ensete Superbum* seeds.

The ethanolic extract of *Ensete Superbum* seeds exhibited a dose dependent inhibition of ulcer index in all the three models. The percentage inhibition in pylorus ligation induced ulcer model was 80.55 & 91.44.The effect of *Ensete Superbum* seeds on acid parameters were also measured in pylorus ligation induced ulcer model. The EEES at 100 and 200 mg/kg dose did show statistically significant effect on acid parameters, total hexoses, hexosamine, fucose and total proteins as compared to standard.

The ethanolic extract of *Ensete Superbum* seeds showed a dose dependent ulcer curative ratio in pylorus ligation ulcers. Even though the extracts reduced the incidence of ulcers when compared to ulcer controls, the inhibition percentage of extract 200mg/kg was almost similar to the standard drug omeprazole, so it may be due to anti-secretory mechanism of *Ensete Superbum* seeds extract.

The inhibition of ulcer lesions in this model may also be due to the antioxidant and anti-secretary activity of the extract of *Ensete Superbum* seeds, which was proved by the early studies on this plant.

According to the old hypothesis, acid secretion was thought to be the sole cause of ulcer formation and reduction in acid secretion was thought to be the major approach towards therapy. However, in the light of recent evidences this concept has changed. Now, treatment of ulcer mainly targets the potentiation of the defensive system along with lowering of acid secretion.

The result of this study confirms the use of the ethanolic extract of *Ensete Superbum* seeds in traditional management of peptic ulcer.

Chemical substances derived from plants have been used to treat human diseases since the dawn of medicine. Roughly 60% of new chemical entities introduced during the past two decades are from natural products. Therefore, efforts should be directed towards isolation and characterization of the active principles and elucidation of the relationship between structure and activity. Furthermore, detailed analysis of the active constituents of natural drugs should be directed towards clinical relevance. Further research is required to isolate the active phytochemical constituents present in the extract and pharmacological studies on the healing action of drug on chronic ulcer as well as on the possible side effects. The investigation on mode of action may pave way for establishment of new anti-ulcer therapy.

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