

VIVEKANAND COLLEGE, KOLHAPUR

(Empowered Autonomous)

SEED MONEY SCHEME FOR RESEARCH

Annual/Final Report of the work done on the Research Project

(Report to be submitted within 2 months after completion of each year)

- 1) Project report No. 1 /2nd (Final): Report no. 1
- 2) University Reference No. VCK/2022-23
- 3) Period of report: 1 year
- 4) Title of research project: Antimicrobial activity of aq. And alcoholic extract of *Terminalia catappa* Linn. on drug resistant bacteria isolated from a clinical sample causing Urinary Tract Infection (UTI)
- 5) (a) Name of the Principal Investigator: Miss. A. A. Jadhav  
(b) Dept. and College where work has progressed: Biotechnology (Optional)
- 6) Effective date of starting of the project: 1 Nov 2022
- 7) Grant approved and expenditure incurred during the period of the report:
  - a. Total amount approved Rs: 1,10,000
  - b. Total expenditure: Rs. 9000
  - c. Report of the work done: (Please attach a separate sheet): Attached

1) Brief objective of the project	Antimicrobial activity of aq. and alcoholic extract of <i>Terminalia catappa</i> Linn. On drug resistant bacteria isolated from a clinical sample causing Urinary Tract Infection (UTI) <ol style="list-style-type: none"><li>1) Collection of samples of materials and sample</li><li>2) Identification of drug resistant bacteria</li><li>3) Antibiotic sensitivity test</li><li>4) Preparation of extracts in methanol and ethanol</li><li>5) Antimicrobial activity by agar well diffusion</li><li>6) Phytochemical analysis</li><li>7) Plagiarism</li><li>8) Referencing and research paper publication</li></ol>
2) Work done so far and results achieved and publications, if any, resulting from the work (Give details of the papers and names of the journals in which it has been published or accepted for publication)	In process



3) Has the progress been according to original plan of work and towards achieving the objective, if not, state reasons	On going
4) Please indicate the difficulties, if any, experienced in implementing the project	-
5) If project has not been completed, please indicate the approximate time by which it is likely to be completed. A summary of the work done for the period (Annual basis) may please be sent to the University on a separate sheet	On going
6) If the project has been completed, please enclose a summary of the findings of the study. Two bound copies of the final report of work done may also be sent to the University	On going
7) Any other information which would help in evaluation of work done on the project. At the completion of the project, the first report should indicate the output, such as (a) Manpower trained (b) Ph. D. awarded (c) Publication of results (d) other impact, if any	-

*[Handwritten Signature]*

Signature of the Principal Investigator

*[Handwritten Signature]*  
PRINCIPAL

Signature of the Principal  
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Recommendation of the expert committee for continuation of the project after 1<sup>st</sup> year.



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Project Title: Antimicrobial activity of aq. and alcoholic extract of *Terminalia catappa* Linn. On drug resistant bacteria isolated from a clinical sample causing Urinary Tract Infection (UTI)

1) Collection of samples & materials:

Fruits, flower, leaves, seeds of the plant *Terminalia catappa* Linn. were collected from Mangalwar peth area. Healthy plant samples were collected and were trimmed, dried and made powder of the same.

2) Preparation of extracts in methanol and ethanol:

Using 95% ethanol and 95% methanol the extracts were prepared by using dried powders (10 g, 20 g & 50 g) The ethanol was evaporated from the extract twice before using it. Using ultrafiltration technique, the sample was filtered & stored in a cool place.

3) Antibiotic sensitivity test:

Antibiotic sensitivity test of the alcoholic extracts of the plant was done on common pathogens like *S. aureus*, *B. subtilis*, *Proteus* spp, *Klebsiella* spp, *E. coli*, *Salmonella*, *Pseudomonas*, etc. Agar well diffusion method by seeded agar and by spread plate technique was used for it. After sufficient incubation zones around the growth of bacteria was observed and measured.

4) Phytochemical analysis:

Phytochemical Screening:

Powdered samples of fruit, flower, stem, leaf, cover and seed of *T. catappa* L. were used for the preparation of aqueous extracts. Plant powder (50 mg) was taken with 99% ethanol and kept 24 hours (overnight) for extraction. Then, it was filtered using Whatman filter paper. Then, sterile filtration was carried out using sterile syringe & the extract was used for the analysis of phytochemicals

a) Steroid

1ml extract was dissolved in 10 ml of chloroform & equal volume of concentrated  $H_2SO_4$  acid was added from the side of test tube. The upper layer turns red and  $H_2SO_4$  layer showed yellow with green fluorescence. This indicates the presence of steroid.

b) Saponin

5 ml extract was mixed with 20 ml of distilled water then agitated in graduated cylinder for 15 min formation of foam indicates Saponin.

c) Coumarin

3 ml of 10% NaOH was added to 2 ml of aqueous extract formation of yellow colour indicates coumarins.

d) Emodin:

2 ml of  $NH_4OH$  and 3 ml of benzidine was added to extract appearance of red colour indicates presence of emodin.



e) Alkaloids

A quantity (3 ml) of concentrated extract was taken into a test tube and 1 ml HCl was added the mixture was heated gently for 20 min cooled and filter, the filtrate was used for following test. i) Wagner test: Filtrate was treated with Wagner's reagent; formation of brown reddish precipitate indicates presence of alkaloids. ii. Hager's test: Filtrate was treated with Hager's reagent, presence of alkaloids confirmed by the yellow colored precipitate.

f) Phenol

Ferric Chloride test: Test extract was treated with 4 drops of Alcoholic FeCl<sub>3</sub> solution. Formation of bluish black colour indicate the presence of Phenol.

The phytochemicals of the plants were checked for the presence of saponins, tannins, steroids, coumarin, emodins, alkaloids, phenol, etc. Stem, seed, cover, fruit contains steroid, seed and cover contains saponin, flower, fruit, stem, leaf contains coumarin. Fruits contain alkaloids & stem contains phenol.

5) **Antibiotic sensitivity test**

Antibiotic sensitivity test was performed on the clinical sample from a Urinary Tract Infection patient to check its resistance against antibiotics like chloramphenicol, erythromycin, fusidic acid, methicillin, novobiocin, penicillin-g, streptomycin tetracyclin by using Antibiotic Susceptibility Octodisc (HiMedia) G-X-plus is an inert flat circular disc having 8 discs of 6 mm diameter on its projections. These discs are coated with antibiotics that aid antibiotic susceptibility testing of Gram-positive organisms. Antibacterial activity was carried out by using Nutrient agar and was autoclaved at 15 lbs. pressure for 20 minutes and cooled to room temperature. The cooled media was poured on to sterile petri plate and allowed for solidification. The plates with media were spread with the respective clinical sample suspension using a spreader. Sterile octodisc was kept on the surface of the agar medium by using sterile forceps. The plates were incubated at 37°C for 24 hours. After incubation period, the diameter of the zone formed around the antibiotic discs were measured and expressed in mm.

- 6) **Identification of drug resistant bacteria: On going**
- 7) **Antimicrobial activity by agar well diffusion: On going**
- 8) **Plagiarism: -**
- 9) **Referencing and research paper publication: -**

