IOSR Journal Of Pharmacy
(e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219
Volume 15, Issue 4 Series. I (April 2025), PP. 17-32
www.iosrphr.org

Nature's Multitasker: Antioxidant, Antimicrobial &Antihelminthic Potentials of Mansoa Alliaceae In Herbal Cream

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Received 05 April 2025; Accepted 15 April 2025

ABSTRACT: -
"Mansoa alliacea (garlic vine)" a medicinal plant belongs to the "**Bignoniaceae family"** and is well known in traditional medicine for its many therapeutic uses, which include anti-inflammatory, antibacterial, analgesic, antioxidant, and antihelminthic properties. The plant's distinctive garlic-like smell and important pharmacological qualities are caused by its abundance of phytochemicals, which include flavonoids, tannins, alkaloids, saponins, and organosulfur compounds. Immune modulation, neuroprotection, and gastrointestinal health are just a few of the health advantages linked to these bioactive chemicals.
"**Antihelminthic efficacy**" is attributed to its capacity to disrupt parasites' metabolic pathways, interfere with their neuromuscular function, and prevent egg hatching and larval development. Additionally, its "**antibacterial effect**" is linked to the disruption of quorum sensing and the rupture of microbial cell membranes, both of which are critical for the survival of bacteria and fungus. The "**antioxidant**" qualities of the plant, which lower oxidative stress and alter important inflammatory mediators.
This study lays the groundwork for further investigation into its safety profile, bioavailability, and its incorporation into contemporary pharmacological formulations. The increasing popularity of plant-based medicine emphasises the necessity of thorough research into its molecular mechanisms and possible interactions with traditional medications.
Keywords: Garlic vine, traditional medicine, anti-helminthic, anti-bacterial, anti-oxidant, immune modulation, neuroprotection.

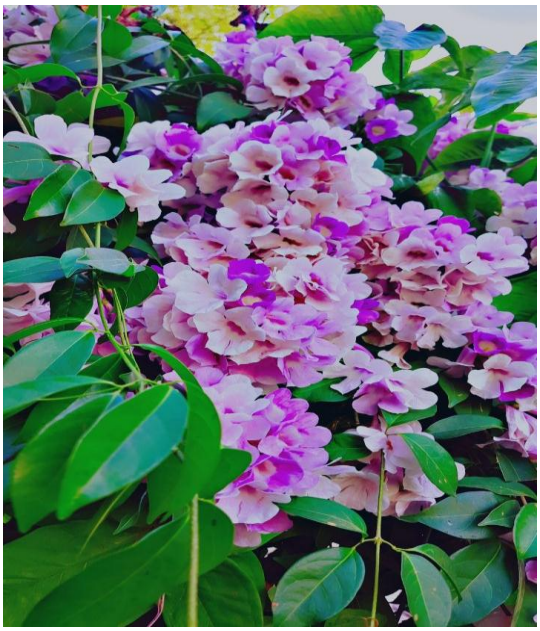
I. INTRODUCTION:

Medicinal plants' varied pharmacological qualities and extensive phytochemical makeup have made them essential to traditional medical systems around the world[1]. Mansoa alliacea (Lam.), another name for garlic vine, is a member of the Bignoniaceae family. Native to Central and South America, this woody climber is a perennial that is especially common in tropical areas of Brazil, Peru, and other Amazonian countries[2]. Its lovely violet blossoms and unique garlic-like scent, which is ascribed to the presence of organosulfur compounds resembling those in Allium sativum (garlic), have led to the plant's widespread cultivation for both therapeutic and decorative uses[3].

Taxonomy of Mansoa alliaceae:

- **Botanical Name:** Mansoa alliacea (Lam.) A. H. Gentry
- **Common Name:** Garlic Vine
- **Common Name Details:** The garlic vine is named so because of its leaves and its flowers with its garlicky smell when crushed.
- **Synonyms:** Bignonia alliacea Lam.
- **Kingdom:** Plantae

- **Phylum:** Streptophyta
- **Class:** Equisetopsida
- **Sub-class:** Magnoliidae
- **Order:** Lamiales
- **Family:** Bignoniaceae
- **Genus:** Mansoa
- **Species:** Mansoa alliaceae
- **Plant Form:** Climbers



Biological Source and Plant Description of Mansoa alliacea :

FEATURE	DESCRIPTION
Plant Type	Woody, evergreen climber (3–5 m tall)
Leaves	Opposite, compound with two oval leaflets and a terminal tendril for climbing
Flowers	Large, trumpet-shaped, violet to lavender, fading with age
Fruits	Flat, elongated seed pods that release winged seeds upon maturity
Aroma	Strong garlic-like scent from leaves and bark due to sulfur-containing compounds

Ethnomedicinal and Pharmacological Importance:

In South American traditional medicine, Mansoa alliacea has long been utilised for its analgesic, anti-inflammatory, antibacterial, and antihelminthic qualities[4]. Different plant components have been used medicinally by indigenous people for a variety of reasons.

- **Leaves and bark**: Used in infusions or decoctions to treat respiratory infections, fever, arthritis, and digestive disorders[5].
- **Roots**: Applied as a remedy for joint pain, muscle soreness, and inflammation.
- **Poultices**: Used externally to relieve swelling, wounds, and insect bites.

II. MATERIALS AND METHODS:

1.Collection and preparation of plant material: Fresh leaves of Mansoa alliacea (Lam.) were gathered from the garden, cleaned, shade-dried, and pulverised (either finely or coarsely) before being sealed in an airtight container for additional phytochemical and physico-chemical tests.

2.Preparation of plant extract: The extraction procedure, which followed the maceration method, used 500 grammes of coarsely powdered Mansoa alliacea (Lam.) leaves. In a big glass container, coarsely ground powdered Mansoa alliacea (Lam.) leaf was added to 80% ethanol for maceration, which produced a hydro-alcoholic extract.

With sporadic stirring, the system was left to stand for three to four days after the glass container was sealed with a glass lid to stop the menstruum from evaporating.After the liquid, or menstruum, was strained, the solid residue—known as marc—was compressed to extract as much of the occluded solution as possible. After the liquid was strained and expressed, it was combined and filtered to make it clearer.
The liquid i.e. the menstruum was then strained and the solid residue, called marc, was pressed to recover as much occluded solution as possible. The strained and expressed liquid thus obtained was mixed and clarified by filtration. The filtration was carried out in a beaker using Whatman's filter paper. The filtrate is collected and evaporated by using rotary evaporator. After evaporation, the hydro-alcoholic extract was collected. The extract is collected in a china dish and placed in a desicator to remove the moisture in the extract.

CHEMICAL CONSTITUENTS IN MANSOA ALLIACEAE:
Mansoa alliacea contain various phytochemical constituents which are responsible for various pharmacological avtivities[6]. The constituents are as follows:-

- **Organo-sulfur compounds:** Dimethyl sulphide, divinyl sulphide, diallyl disulphide, diallyl trisulfide, and diallyl sulphide. These compounds contribute to the plant's anti-microbial and anti-inflammatory properties.
- **Sterols:** Fucosterol, stigmasterol, beta-sitosterol, and daucosterol. These exhibits anti-inflammatory and cholesterol lowering properties.
- **Terpenoids:** Ursolic acid and betulinic acid. These attribute anti-fungal,anti-microbial and anti-viral properties.
- **Flavanoids:** Luteolin, 7-O-methylscutellarein, quercitin and apigenin. These possess strong anti-oxidant, anti-inflammatory and neuroprotective activities.
- **Alkaloids:** Mansoine, β-carbolines, indole alkaloids. These have anti-inflammatory, neuroprotective and analgesic properties.
- **Saponins:** Triterpinoids. These exhibit immunomodulatory and anti-fungal activities.
- **Phenolic compounds:** Gallic acid, ellagic acid, ferulic acid, caffeic acid. These exhibit strong free-radical activity, with anti-oxidant properties.
- **Tannins:** Catechins, proanthocyanidins. These contribute astringent, anti-microbial & wound-healing properties[7].

PRILIMINARY PHYTOCHEMICAL TESTS:-
1)TESTS FOR ALKALOIDS:
a. Dragandroff's test: To 1 ml of each of the sample solution taken in a test tube few drops of Dragendorff's reagent (potassium bismuth iodide solution) was added. A reddish brown precipitate was observed indicating the presence of alkaloids.
b. Mayer's test: To 1ml of each of the sample solution few drops of Meyer's reagent (potassium mercuric chloride solution) was added. A creamish white precipitate was formed indicating the presence of alkaloids.
c. Wagner's test: Wagner's reagent (iodine in potassium iodide) was added to a few ml of each sample solution, causing a reddish-brown precipitate to develop, signifying the presence of alkaloids.

2)TESTS FOR FLAVANOIDS:
a. Lead acetate test: When test samples were mixed with water and gelatin, a white precipitate formed.
b. Ferric chloride test: When a few drops of ferric chloride were added to few ml of test samples that had been obtained separately, a blackish red precipitate formed.
c. Shinoda test: (Magnesium hydrochloride reduction test): A few pieces of magnesium ribbon and strong hydrochloric acid were added dropwise to the test solution, resulting in a reddish to pink hue.
d. Alkaline reagent test: The presence of flavonoids is shown by the test samples' significant yellow colour development when sodium hydroxide solution is introduced, which fades after a few drops of diluted acid are added.

3)TESTS FOR TANNINS AND PHENOLS:
a. Ferric chloride test: A blackish precipitate formed when a few drops of ferric chloride were added to the sample solution.
b. Gelatin test: When test samples were mixed with water and gelatin, a white precipitate formed.
c. Lead acetate test: When test samples were mixed with water and gelatin, a white precipitate formed.
d. Ellagic acid test: When 5% glacial acetic acid and 5% sodium nitrite were added to test samples a muddy niger brown colour appears, which is a positive result for phenols.

4)TEST FOR GLYCOSIDES:
a. Legal's test: When the test samples were treated with pyridine and sodium nitroprusside solution blood red colour appears.
b. KellarKiliani test: One ml of concentrated sulphuric acid was placed in a test tube, and after adding five ml of extract, two ml of glacial acetic acid, and a single drop of ferric chloride, a blue tint formed.
c. Concentrated sulfuric acid test: Conc.H2SO4 was added to the test sample, giving it a reddish colour.

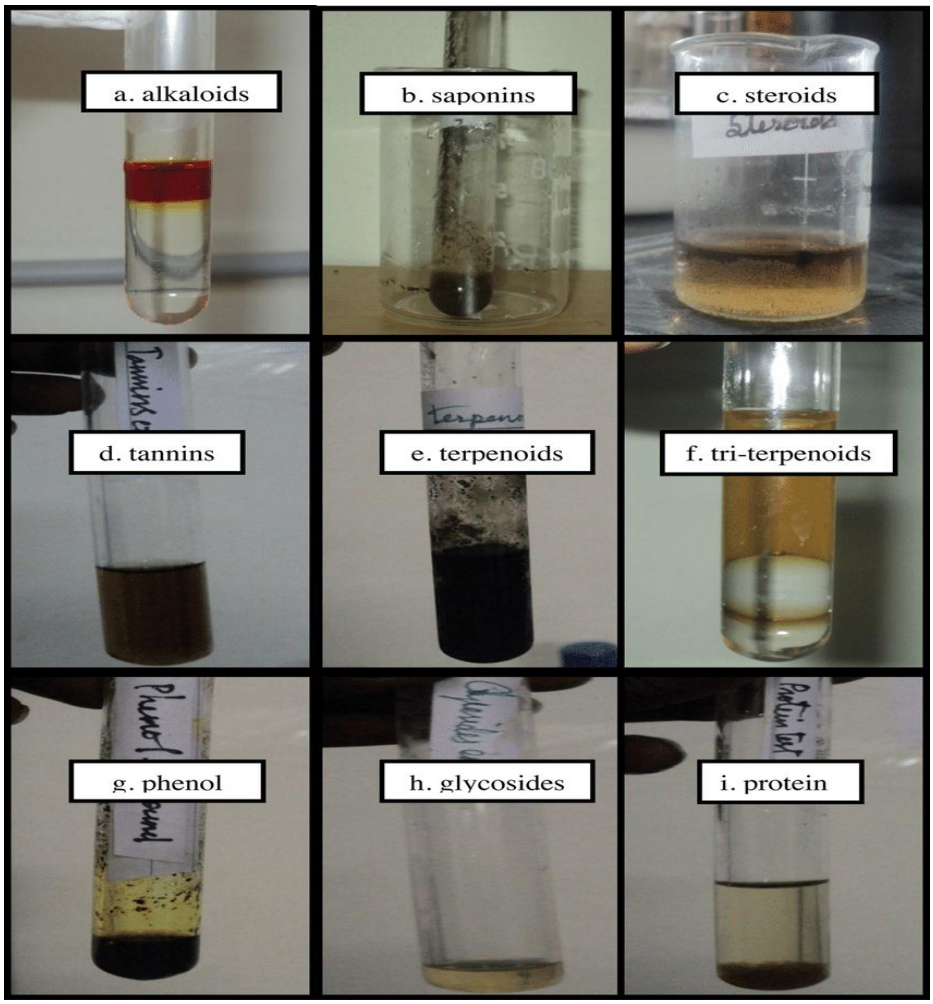
5)TEST FOR STEROLS:
a. Libermann-Buchard test: Samples that were treated with a few drops of acetic anhydride, boiled, and then treated with a few drops of strong sulphuric acid from the test tube's sides display a brown ring where two layers meet, and the top layer turns green, indicating the presence of steroids.
b. Salkowski test: The presence of sterols is shown by the red colour that forms at the lower layer when a few drops of strong sulphuric acid are applied to the test samples in chloroform.

6)TEST FOR QUINONES:
a. Alcoholic KOH test: The test samples showed a reddish-blue colouration upon the addition of alcoholic KOH, indicating a positive quinine reaction.

7)TEST FOR SAPONINS:
a. Foam test: 5ml of extract were shaken briskly to produce a stable, long-lasting froth. The presence of saponins was then determined by mixing the froth with three drops of olive oil and watching for the creation of an emulsion[8].

Table-1: Phytochemical tests for leaf extract of Mansoa Alliaceae

TEST OF PHYTO CONSTITUENT	NAME OF TEST	NAME OF SOLVENT (ETHANOL)
ALKALOIDS	Dragondroff's test	+
FLAVANOIDS	Shinoda test	+
TANNINS	Lead acetate test	+
PHENOL	Ellagic test	+
GLYCOSIDES	Legal's test	+
STEROLS	Libermann-Buchard test	+
QUINONES	Alcoholic KOH test	+
SAPONINS	Foam test	+



ANTI-MICROBIAL ACTIVITY:-

The leaves of the Mansoa alliaceae family are especially well-known for their extensive antibacterial activity against a range of illnesses. Bioactive substances like alkaloids, flavonoids, tannins, saponins, and phenolic acids are linked to the antibacterial properties of plant extracts.

This study aims to evaluate the antibacterial activity of Mansoa alliaceae leaf extract against two bacterial pathogens: Staphylococcus aureus [S. aureus], a gramme positive, and Escherichia coli [E. coli], a gramme negative. Antimicrobial activity was measured using the Pour Plate Method and the Spread Plate Method, which are standard techniques for assessing the efficacy of antimicrobial agents.

Mechanism:

The antimicrobial activity of *Mansoa alliaceae* leaves through multiple mechanisms:

Disruption of Cell Membrane Integrity:

Acetogenins and flavonoids interact with microbial cell membranes, increasing permeability and leading to leakage of intracellular contents, ultimately causing cell lysis.

Inhibition of Enzyme Activity and Metabolism:

Alkaloids and phenolic chemicals disrupt bacterial DNA gyrase and metabolic pathways, preventing replication and energy production.

Reactive Oxygen Species (ROS) Production:

Certain phytochemicals cause microbial cells to undergo oxidative stress, which results in DNA damage and protein oxidation.

Protein Synthesis Inhibition:

Some chemicals bind to ribosomal subunits, stopping bacteria from synthesising proteins and growing.

Biofilm Disruption:

The extract inhibits bacterial adhesion and destroys extracellular polymeric substances (EPS), lowering biofilm development.

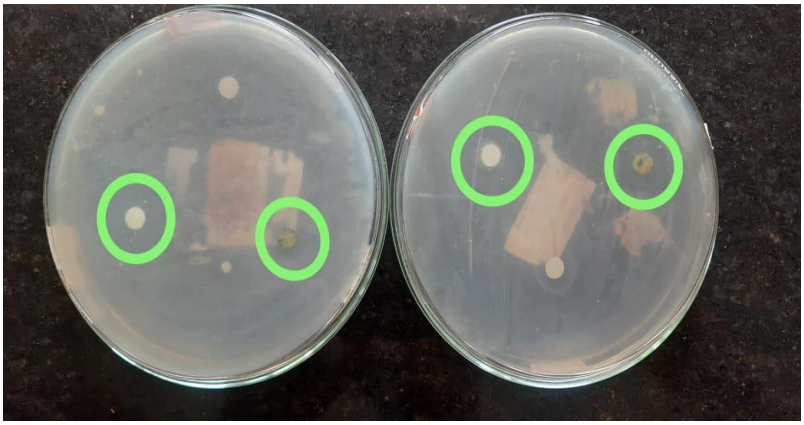
PROCEDURE:-

Nutrient broth medium was prepared by dissolving the specified ingredients in 500ml of water, adjusting the pH, autoclaving at 121°C for 20 minutes, and pouring the medium into sterile Petri plates. The test organisms were Escherichia coli and Staphylococcus aureus. Both bacterial strains obtained from a microbiological laboratory. The discs are soaked in Mansoa alliaceae leaves extract , ethanol as a control and amikacin sulphate solution as a standard.

The antimicrobial activity was evaluated using two different methods: Pour Plate Method and Spread Plate Method.

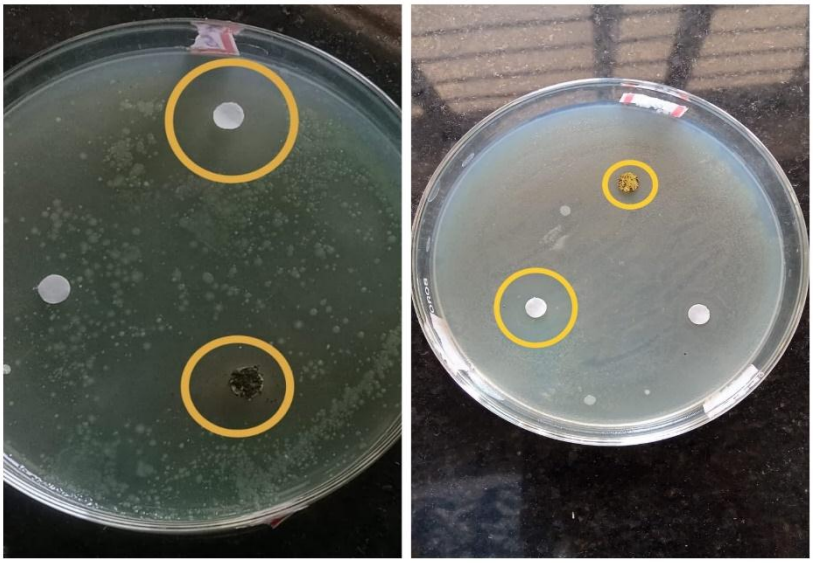
a. Pore-plate method:

Prior to the medium being placed into the sterile petridishes and allowed to settle, the test organisms are first inoculated into it. Following solidification, the discs are positioned differently [ethanol as a control, amikacin sulphate solution as a standard, and Mansoa alliaceae leaves as an extract]. For a whole day, the plates were incubated at 37°C. The antibacterial activity was evaluated by measuring the zones of inhibition surrounding each well following incubation.



b. Spread plate method:

First, the sterile petridishes are filled with the medium, which is then let to harden. Following solidification, cotton was used to disperse a little amount of test organisms (a few millilitres) among the solidified petriplates. The discs are then positioned differently [ethanol as a control, amikacin sulphate solution as a standard, and Mansoa alliaceae leaves as an extract]. For a whole day, the plates were incubated at 37°C. The antibacterial activity was evaluated by measuring the zones of inhibition surrounding each well following incubation.



III. RESULTS AND DISCUSSSION :-

OBSERVATION:

Bacteria	Extract (PPM)	Standard (PPM)	Control (PPM)	Extract (SPM)	Standard (SPM)	Control (SPM)
E. coli	**1.25 mm**	**2.575 mm**	**0.525 mm**	**1.1 mm**	**2.15 mm**	**0.725 mm**
S. aureus	**1.6 mm**	**2.25 mm**	**0.6 mm**	**1.6 mm**	**1.95 mm**	**0.925 mm**

% Inhibition using the formula:

%Inhibition = [Zone of Inhibition−Control]/Zone of Inhibition)×100

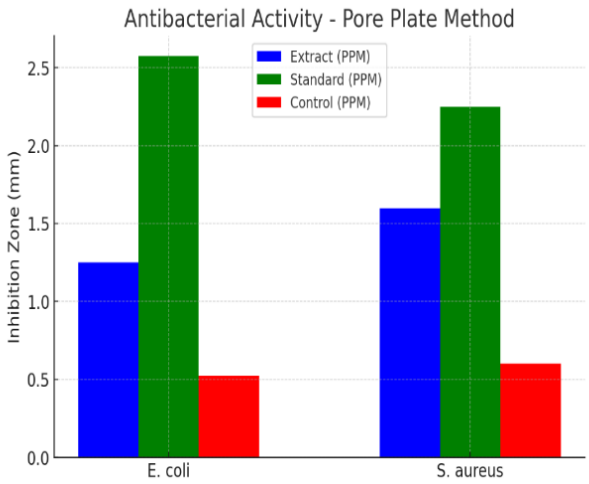
1)Pour Plate Method (PPM)

E. coli:

[1.25−0.525]/1.25×100 =58%

S. aureus:

[1.6−0.8]/1.6×100 = 50%



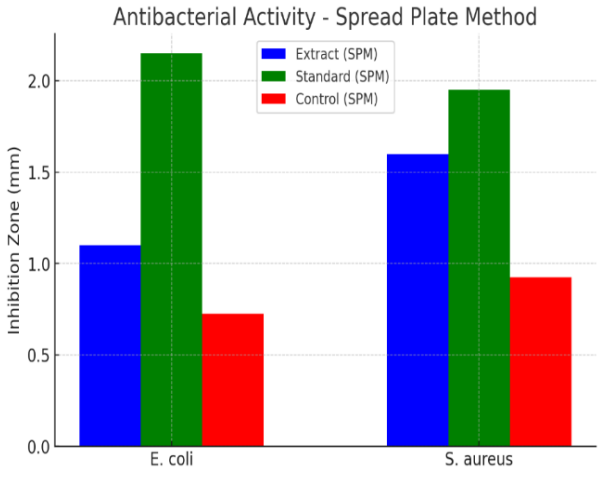
2)Spread Plate Method (SPM)

E. coli:

[1.1−0.725]/1.1×100 = 34.09%

S. aureus:

[1.6−0.925]/1.6×100 = 42.18%



DISCUSSION: -

The Pour Plate Method (PPM) and Spread Plate Method (SPM) are used to assess the antibacterial activity of an extract against E. coli and S. aureus, respectively. The percentage inhibition observations show that the extract has high antibacterial activity, with inhibition rates of **58%** for E. coli and **50%** for S. aureus in PPM and **34.09%** for E. coli and **42.18%** for S. aureus in SPM. The extract consistently demonstrated a wider zone of inhibition than the standard and control, indicating a substantial antibacterial action. Notably, E. coli demonstrated slightly higher inhibition rates, indicating greater vulnerability than S. aureus. Furthermore, the inhibitory zones in SPM were slightly larger than those in PPM, indicating that bacterial interactions with the extract may differ between methods.

ANTI-OXIDANT ACTIVITY: -

Antioxidants are essential for neutralising free radicals and avoiding oxidative stress-related diseases like cancer, diabetes, and neurological disorders. Mansoa alliaceae (also known as garlic vine) has been extensively researched for its pharmacological qualities, including antioxidant activity. The inclusion of bioactive substances such as flavonoids, alkaloids, phenolics, and tannins increases the antioxidant potential of A. squamosa leaves.
The 2,2-diphenyl-1-picryl hydrazyl (DPPH) radical scavenging assay is one of the most widely used methods for determining antioxidant activity in plant extracts. This method depends on antioxidants' ability to donate electrons or hydrogen atoms to DPPH radicals, reducing them to a non-radical form which produces a colour shift that may be measured spectrophotometrically. Ascorbic acid (vitamin C) is used as the standard antioxidant in this study for the purpose of comparison**.**

MATERIALS AND METHODS:-

Plant Sample Collection and Extraction:-

Fresh Mansoa alliaceae leaves are collected, washed, shade-dried, and milled into a fine powder. Extraction is carried out using solvents such as ethanol or aqueous solutions. The extract is produced through maceration and then filtered and concentrated under low pressure.

DPPH Radical Scavenging Assay:-

- **Principle of the DPPH Assay:-**

The DPPH assay involves reducing the stable purple-colored DPPH radical to a yellow-colored diphenyl picryl hydrazine molecule in the presence of an antioxidant. The reduction is assessed by measuring the drop in absorbance at 517 nm with a UV-Vis spectrophotometer.

MATERIALS REQUIRED:-

- *Mansoa alliaceae* leaf extract (prepared using solvents like ethanol, or aqueous extraction)
- DPPH solution [0.1 mM in Ethanol]
- Ascorbic acid (as a standard antioxidant)
- Ethanol
- Pipettes & Test tubes or 96-well plate
- Spectrophotometer or microplate reader [set to 517 nm]

MECHANISM:-

The antioxidant activity of Mansoa alliaceae leaves is determined by the DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay, which employs a single-electron transfer (SET) and hydrogen atom transfer (HAT) method.

1.Radical Nature of the DPPH:-

DPPH is a stable free radical with a rich violet hue due to its unpaired electron. The UV-Vis spectrum shows a significant absorption at 517 nm.

2.Interaction of Mansoa alliaceae Leaf Extract with DPPH:-

The leaf extract contains bioactive components that act as antioxidants, including flavonoids, phenolics, alkaloids, and tannins. These antioxidants provide either:

Hydrogen atom (H•) → Hydrogen Atom Transfer (HAT).

A single electron (e□) leads to a single electron transfer (SET) mechanism.

3. Radical Neutralisation: -

The antioxidant compounds in the leaf extract lower the DPPH radical (DPPH•) by donating hydrogen or electrons:

DPPH• + AH → DPPH-H + A•

DPPH• (radical form, violet) combines with AH (an antioxidant included in the extract). This results in DPPH-H (non-radical, yellow or colourless).A• refers to the antioxidant's oxidised state.

PROCEDURE:

1] Preparation of DPPH solution:-

4mg of 2,2-diphenyl-1-picryl hydrazyl (DPPH) is dissolved in 100ml of ethanol. The mixture has been kept for 30 minutes in the dark at room temperature (DPPH is light-sensitive).

2] Preparation of standard solution: -

100mg of Ascorbic acid is dissolved in 100ml water. Ascorbic acid solutions of different concentrations (e.g., 50, 100, 200, 300, 400, 500 µg/mL) are prepared in water.

3] Preparation of extract solution: -

100mg of concentrated Annona squamosa extract is dissolved in ethanol. solutions of different concentrations (e.g., 50, 100, 200, 300, 400, 500 µg/mL) are prepared in ethanol.

4]Antioxidant Assay procedure: -

From the DPPH solution, take 6ml of DPPH solution that should be taken in to test tube and add 0.2ml of each concentration of Ascorbic acid solution should be added. The solutions have been kept for 30 minutes in the dark at room temperature. After 30min, the absorbance is measured at 517 nm using a UV-Visible spectrophotometer. Same procedure was repeated for extract solutions and absorbance is measured at 517 nm using a UV-Visible spectrophotometer.

The % inhibition of DPPH radicals can be calculated using the following formula:

DPPH Scavenging Activity (%) = (Acontrol −Asample) / Acontrol×100

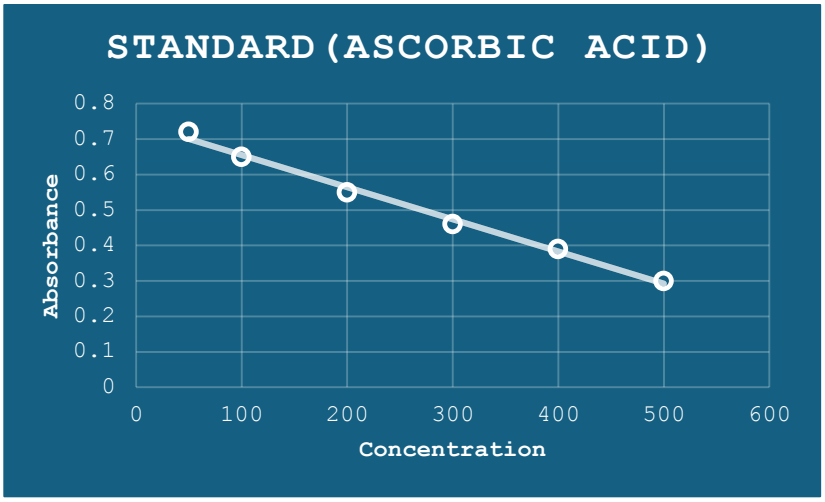
Where,

- $A_{control}$ = Absorbance of DPPH solution without the sample (blank)
- A_{sample}=Absorbance of DPPH solution with the plant extract/sample

STANDARD TABLE & GRAPH: -

(Control absorbance = 0.600 µg/ml as per 50 µg/ml concentration)

Type	**Concentration (µg/ml)**	**Absorbance (nm)**	**% Inhibition (%)**
Standard-1	50 **µg/ml**	0.600	45.00%
Standard-2	100 **µg/ml**	0.480	55.5%
Standard-3	200 **µg/ml**	0.360	65.5%
Standard-4	300 **µg/ml**	0.290	71.2%
Standard-5	400 **µg/ml**	0.200	78.9%
Standard-6	500 **µg/ml**	0.130	85.0%



Calculation:

Control Absorbance = 0.600 (at 50 µg/ml for standard)

Using the formula for linear interpolation:

$$IC50 = C_1 + (50 - I_1/I_2 - I_1) \times (C_2 - C_1)$$

Where:

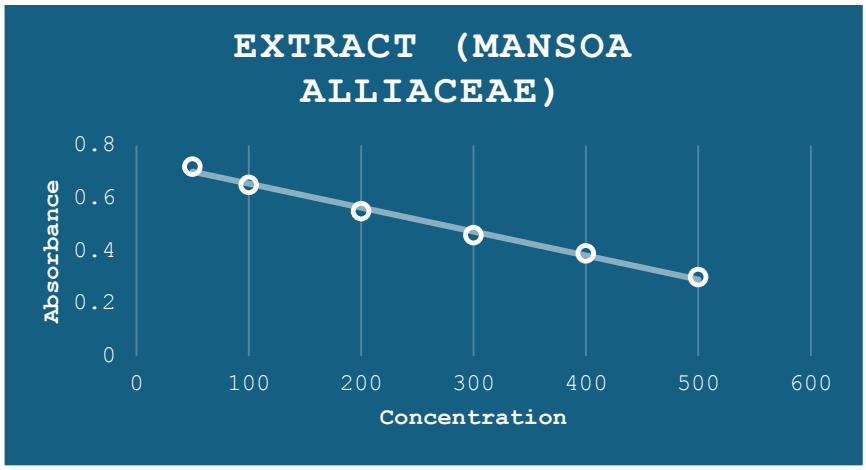
- C1=50µg/ml (concentration before 50% inhibition)
- C2=100µg/ml (concentration after 50% inhibition)
- I1=45.00%% (inhibition at C1)
- I2=55.5% (inhibition at C2)

IC□□ for the standard is **73.81µg/ml**

EXTRACT TABLE &GRAPH:-

(Control absorbance = 0.720 µg/ml as per 50 µg/ml concentration)

Type	**Concentration (µg/ml)**	**Absorbance (nm)**	**% Inhibition (%)**
Standard-1	50 **µg/ml**	0.720	40.5%
Standard-2	100 **µg/ml**	0.650	47.2%
Standard-3	200 **µg/ml**	0.550	55.8%
Standard-4	300 **µg/ml**	0.460	62.5%
Standard-5	400 **µg/ml**	0.390	68.9%
Standard-6	500 **µg/ml**	0.300	75.0%



Calculation:

Control Absorbance = 0.720 (at 50 µg/ml for standard)

Using the formula for linear interpolation:

$$IC50 = C_1 + (50 - I_1/I_2 - I_1) \times (C_2 - C_1)$$

Where:

- C1=100µg/ml (concentration before 50% inhibition)
- C2=200µg/ml (concentration after 50% inhibition)
- I1=47.2%% (inhibition at C1)
- I2=55.8% (inhibition at C2)

IC□□ for the standard is **132.56µg/ml**

IV. CONCLUSION:

The antioxidant capability of Mansoa alliaceae extract was assessed in this study, and its activity was contrasted with that of a reference antioxidant. Considering the outcomes of the DPPH assay:

- The existence of active phytochemicals that can neutralise free radicals was shown by the extract's dose-dependent antioxidant activity.

- Even though the extract is not as strong as the standard, it nevertheless has a notable antioxidant capacity, as seen by its calculated IC_{50} value of 132.6 µg/mL versus the standard's IC_{50} of 73.8 µg/mL.
- Bioactive substances such flavonoids, tannins, saponins, and phenolics, which are frequently present in Mansoa alliaceae, are probably responsible for this activity.
- According to the results, Mansoa alliaceae has long been used in herbal therapy, and it may also be used in natural antioxidant formulations for medicinal and nutraceutical uses.

ANTI-HELMINTHIC ACTIVITY OF MANSOA ALLIACEAE: -

Mansoa alliacea is used in ethnomedicine for its anthelmintic properties, suggesting that it is a resource for anthelmintic activity. The anthelmintic properties of M. alliacea are significantly dose-dependent in comparison to those of regular anthelmintics. However, the superb effects of methanol extract on M. alliacea can be ascribed to bioactive phytoconstituents such as tannins, alkaloids, flavonoids, and saponins. A number of these phytoconstituents, including tannins, phenols, alkaloids, and flavonoids, might be responsible for the notable anthelmintic action.

MECHANISM OF ACTION:

1.Disruption of neuromuscular activity:

- Mansoa alliacea contains alkaloids and flavonoids that disrupt helminth neurotransmission, causing paralysis and ultimately death.
- By blocking ion channels and receptors (such as GABA and acetylcholine receptors), these substances hinder muscle contraction and movement, which makes it impossible for the parasite to stay attached to host tissues.

2.Membrane disruption and cytotoxicity:

- The extract contains tannins and saponins that interact with proteins and lipids to break down the parasite's cuticle, causing membrane damage and increased permeability.
- Dehydration and the parasite's demise follow from the lack of essential nutrients and water.

3.Inhibition of enzyme metabolism:

- Some bioactive substances disrupt the helminths' glycolytic pathway, which lowers ATP synthesis and hinders the organisms' ability to survive.
- Compounds with sulphur, which have oxidative qualities, can interfere with mitochondrial function and cause energy loss.

4.Enzyme inhibition:

- Mansoa alliacea contains phenolic compounds that block important enzymes necessary for helminth survival, including glutathione transferase and acetylcholinesterase (AChE).
- Loss of cellular homeostasis, oxidative stress, and the buildup of harmful metabolites are the outcomes of this inhibition.

5.Induction of oxidative stress:

- The extract induces helminths to produce reactive oxygen species (ROS), which harms their proteins, lipids, and nucleic acids.
- The parasites are eventually killed by necrosis and apoptosis brought on by this oxidative stress.

MATERIAL AND METHODS: -

1.Plant collection and extraction:

- Mansoa alliacea leaves were gathered, cleaned, and allowed to dry in the shade.
- Using Soxhlet extraction or maceration, the dried leaves were ground into powder and extracted with ethanol (or aqueous extraction).
- To get a semi-solid residue, the extract was filtered and concentrated using a rotary evaporator.

2.Preparation of test solutions:

- The extract was dissolved in distilled water or DMSO to create stock solutions at various strengths (e.g., 40,50,60,70,80 mg/mL).
- As a standard reference medication, mebendazole or albendazole was utilised at comparable concentrations.
- DMSO or distilled water alone were used to treat the control groups.

3.Selection of Helminths:

- Eisenia fetida (worm that present in vermi-compost).

4.In-vitro anti-helminthic assay:

- The selected worms were split up into groups and put on petri dishes with different amounts of the extract, the standard drugs, and control solutions.
- The worms were observed for:

1. **Paralysis time:** The amount of time it takes for worms to stop moving when shaken.
2. **Death time:** The amount of time that worms remain motionless even after being stimulated with a needle.

5.Data analysis:

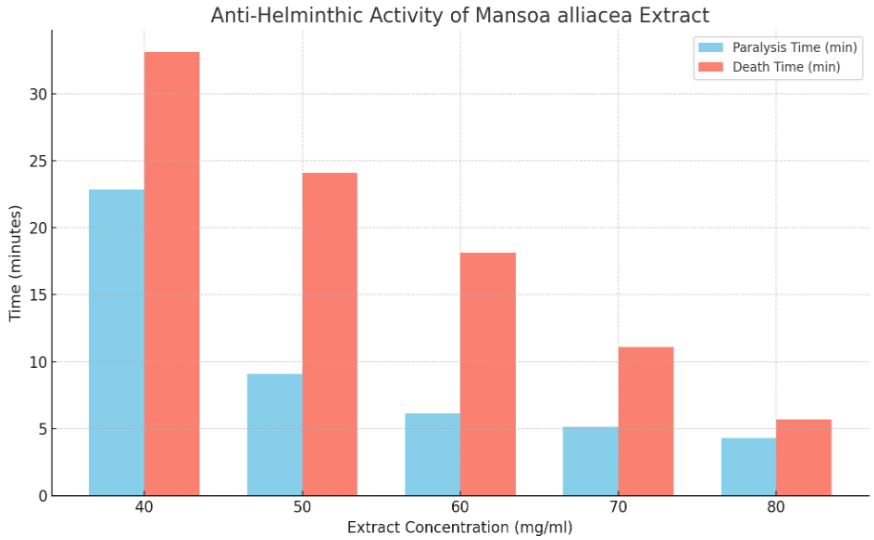
- The results were compared with standard and extract groups.

For both extract and standard concentrations:
a) 40mg/ml **b**) 50mg/ml **c**) 60mg/ml **d**) 70mg/ml **e**) 80mg/ml **f**) control

RESULTS AND DISCUSSION:

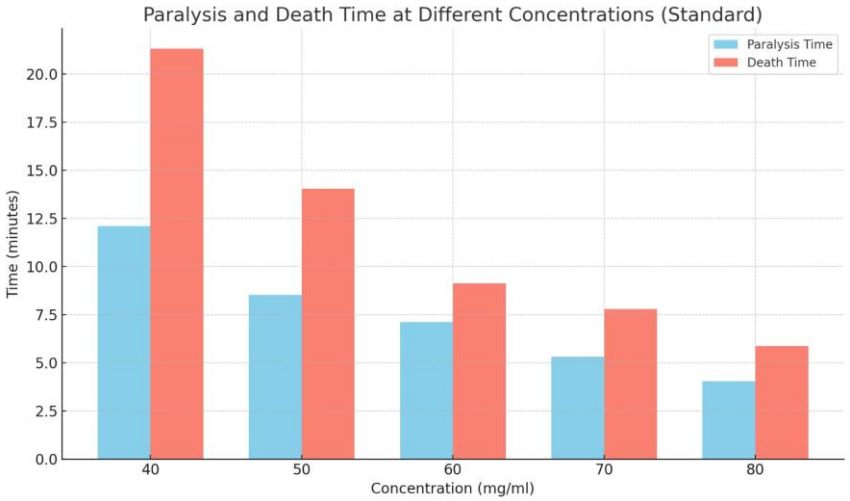
Extract:

S.No	Concentration (mg/ml)	Paralysis time	Death time
1.	40	22min51sec	33min6sec
2.	50	9min6sec	24min7sec
3.	60	6min8sec	18min8sec
4.	70	5min9sec	11min7sec
5.	80	4min19sec	5min42sec



Standard(Albendazole):

S. No	Concentration (mg/ml)	Paralysis time	Death time
1.	40	12min6sec	21min18sec
2.	50	8min31sec	14min2sec
3.	60	7min7sec	9min8sec
4.	70	5min19sec	7min48sec
5.	80	4min2sec	5min52sec



DISCUSSION:

- For both the extract and standard dosages, the worms' paralysis and death periods shortened as the concentration raised.
- **Mansoa alliacea extract** exhibited anthelminthic efficacy that was dose-dependent. The extract produced **paralysis** in **4 minutes 19 seconds** and **death** in **5 minutes 42 seconds** at **80 mg/ml**, which is similar to the normal medication's for both the extract and standard dosages, the worms' paralysis and death periods shortened as the concentration raised.
- In comparison to normal medicine, the extract was "less efficacious at lower doses" (e.g., 40 mg/ml). Nevertheless, the extract's potency neared that of the standard at higher concentrations (70–80 mg/ml).
- This suggests that bioactive chemicals found in Mansoa alliacea disrupt the worms' neuromuscular system and may have an impact on acetylcholine signalling, which could result in paralysis and death.

CONCLUSION:

The current study shows that Mansoa alliacea ethanolic extract has strong anti-helminthic properties, reducing helminth paralysis and death times in a dose-dependent manner. At greater doses (70–80 mg/mL), the extract demonstrated similar efficacy to the usual medication, with a significantly shorter time needed to cause paralysis and death. These results imply that bioactive substances with strong anthelmintic effects are present in Mansoa alliacea, maybe as a result of secondary metabolites such flavonoids, alkaloids, and saponins. Additional phytochemical and mechanistic research is necessary to identify the active ingredients and comprehend how they work, as this could aid in the creation of innovative plant-based antihelminthic treatment.

FORMULATION FOR EXTRACT OF MANSOA ALLIACEAE: -
IN VANISHING CREAM:
Procedure for Vanishing Cream with Mansoa alliaceae Extract
Phase 1: Water Phase:

- Dissolve Potassium Hydroxide in purified water with continuous stirring.
- Add Glycerin to the solution and mix well.
- Warm the Water Phase to around 70-75°C.

Phase 2: Oil Phase:

- Melt Stearic Acid in a separate vessel at 70-75°C.

Phase 3: Emulsification:

- Slowly Add the Oil Phase to the Water Phase while stirring continuously to form an emulsion.
- Maintain the Temperature at 70-75°C and continue stirring for 15-20 minutes until a uniform mixture is formed.

Phase 4: Cooling & Addition of Extract:

- Allow the Mixture to Cool to around 40°C.
- Incorporate the Mansoa alliaceae Extract into the cooled emulsion while stirring gently. (The amount of extract depends on your experimental concentration.)

Phase 5: Final Mixing & Packaging:

- Mix Thoroughly to ensure uniform distribution of the extract.
- Transfer the Cream into Suitable Containers and store at room temperature.

S. No	Ingredients	Quantity (for 100gms)	Purpose
1	Garlic vine extract	0.05gms	Antioxidant.
2	Stearic acid	18.8 gms	Oleogenous agent/ emulsifying agent, thickening agent.
3	Potassium hydroxide(KOH)	0.98 gms	Saponifying agent & PH adjuster.
4	Glycerin	2.7gms	Humactant, moisturizer.
5	Purified Water	80 ml	Vehicle.

EVALUATION TEST FOR VANISHING CREAM: -

1.Physical Appearance test:

- The cream must to be homogenous, lump-free, and free of phase separation.
- Over time, texture and colour should not change.

2.Ph measurement:

- The ideal pH range for skin application is 5.5 to 6.5.
- Determined with a digital pH meter.

3.Spreadability:

- This assesses the cream's skin-spreading ease.
- Improved spreadability translates into increased user comfort and coverage.

4.Washability:

- Water should be able to easily remove the cream.
- After washing, there shouldn't be any sticky or oily residue.

5.Irritability test:

- A tiny bit of cream is put behind the ear or on the forearm.
- 24-hour check for allergic response, itching, or redness.

6.Stability testing:

- The cream is kept for one to three months at various temperatures (room temperature, 40°C, and refrigerator).
- Check for variations in scent, colour, or texture.

7.Viscosity test:

- Measures how thick or fluid the cream is.
- Ensures it is neither too runny nor too thick.

8.Moisture content test:

- Determines the amount of water in the cream.
- Affects shelf life and microbial growth potential.

RESULT & OBSERVATION: -

Test	Observation	Result
Physical appearance	Smooth, light green cream with no phase seperation	Aceeceptable
Ph measurement	Ph=6.5 (skin friendly)	Within ideal range
spreadability	Spread easily with slight pressure	Good
washability	Removable with water,no sticky residue	Satisfactory
Irritation test	No irritation, redness or itching observed after 24hrs	Safe for skin
Stability testing	Stable under various storage condition	Physically and chemically stable
Viscosity test	Medium consistency, not too much thick or runny	Optimal
Moisture content	Moderate water content	Acceptable

ACKNOWLEDGEMENT: The authors would like to express their gratitude to Name(s) or Organization(s) for their insightful conversations and insightful observations of the intricate interactions that occur within microbial communities. We express our special gratitude to certain people or organisations for their knowledge and recommendations, which enhanced the viewpoints offered in this review.

V. CONCLUSION:

The study confirms that *Mansoa alliacea* exhibits significant antimicrobial, antioxidant, and anti-helminthic activities. The formulated vanishing cream was stable and skin-compatible, supporting its potential use in herbal therapeutic and cosmetic applications.

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