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Review Article

Introduction To Lepidium Sativum Linn Seeds, And Extraction Of Mucilage

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ABSTRACT

Lepidium sativum linn is an annual, erect, globous and edible herbaceous plant that belongs to the family of Brassicaceae and it is cultivated as culinary vegetable in different regions of the Asia and Europe.[1] This herbaceous plant is extensively used in traditional and modern systems of medicines due to their excellent therapeutic potentials owing to anti-diarrheal, anti –spasmodic, laxative hypoglycaemic, hypolipidemic, anti-microbial, anti – inflammatory, anti-hypertensive, analgesic, anti-pyretic, anti- diabetes etc. The results showed that the granules prepared from extracted mucilage as a binder had good flow and mechanical properties, all evaluated parameters were within the permissible limits. Thus, mucilage could be used as an alternative binding agent in pharmaceutical granules.[2]

INTRODUCTION

Garden cress (Lepidium sativum L.) is grown as a culinary vegetable throughout Asia and Europe. It is a member of the Brassicaceae family. This plant is native to southwest Asia, and it is known to have travelled to Western Europe many years ago. There are between 175 and 220 species in the genus Lepidium, most of which are found in warm climates. These species are found all over the world, with the largest variety found in the Mediterranean, parts of North America, and Central and West Asia. The most popular names for Lepidium sativum L. are "Halim," "Common cress," or "Garden cress." It is also known as "Thufa" or "Habel Rashaad" in Saudi Arabia, among other names.[3] Even before the breed was identified, the Persians were known to consume this herb, according to Xenophon (400 BC). It was also well-known to the Egyptians, and the Greeks and Romans, who enjoyed feasts abundant in salads and spices, much valued it. According to

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Islamic scientists, it is utilized to eradicate stomach worms. Mediterranean people used chandrasoor to shield crops from pests and other environmental irritants. Famous physician Hebn AL-Bautas thoroughly researched the medical use of chandrasoor in the eighth century; he said that it promotes hunger and gets rid of stomach worms. In paralysis, the Chandrasoor is an effective treatment. Should hairs be cleansed using the sacred water of Chandrasoor.[4]

PLANT PROFILE

Synonyms : The most popular names for Lepidium sativum L. are "Halim," "Common cress," or "Garden cress." It is also known as "Thufa" or "Habel Rashaad" in Saudi Arabia, among other names. Arabis chinensis, Cardamon sativum, Crucifera nasturtium, Lepia sativa,Lepidium hortense, Lepidium sativum var. crispum, Lepidium

- sativum subsp. sativum, Lepidium sativum var. spinescens, Lepidium
- sativum subsp. spinescens, Lepidium spinescens, Nasturtium crispum,
- Nasturtium sativum, Nasturtium spinescens, Thlaspi nasturtium,
- Thlaspi sativum and Thlaspidium sativum .

Some of its common names in different languages

- are as follows; in Urdu and Sanskrit "Halim"; in English
- "Common Cress"; in Hindi "Chansur"; in Kashmiri "Alian";
- in Marathi "Ahaliva"; in Oriya "Chandasura"; in Tamil
- "Allivirai"; in Malayalam "Asali" and in Gujrati "Aseliyo".[5]

Common species of Lepidium

1. **Lepidium draba:**

It is found in Punjab as a weed that is grown there. It can be found in the Mediterranean region, Europe, the Caucasus, Mesopotamia, and Persia. It is claimed that the plant has antiscorbutic qualities and that using it raw will cause bleeding. If seven or eight seeds are consumed at once, they might be used as a remedy for flatulence. It is used as a stomachic and tonic in Waziristan and as an antiscorbutic in Europe. Transversely oblong, tip whole, wingless pods

2. **Lepidium crassifolium**:

It originated in Baluchistan and spread throughout Europe's oriental region. Internal use of the seeds is recommended for rheumatism and dropsy. The plants are used to treat rheumatism as a rubefacient. Ellipse pods have a complete ovoid tip, wingless value, and fleshy leaves.

3. **Lepidium latifallum:**

It can be located in Kashmir. It is found in northern and western Asia as well as Europe. The herb has purifying and antiscorbutic properties. It is applied to skin conditions. Ellipse pods have a full ovoid tip, lack wings, and have fleshy leaves and roots.

4. **Lepidium Ruderale:**

It can be found between 7,000 and 3000 feet in Kashmir. It goes all the way to Europe via the Orient. Australia is another place where it happens. The herb is applied to impetigo.

5. **Lepidium perfoliatum:**

It is found in Afghanistan and Baluchistan, from whence it spreads over the eastern region encompasses southern Europe. This herb is widely thought to be a helpful antiscorbutic in Europe.[6]

BIOLOGICAL SOURCE:

A annual, globous, erect, and edible herb, garden cress (Lepidium sativum L.) is grown as a culinary vegetable throughout Asia and Europe. It is a member of the Brassicaceae family. This plant is native to southwest Asia, and it is known to have travelled to Western Europe many years ago. There are between 175 and 220 species in the genus Lepidium, most of which are found in warm climates. These species are found all over the world, with the largest variety found in the Mediterranean, parts of North America, and Central and West Asia.

MORPHOLOGY OF PLANTS

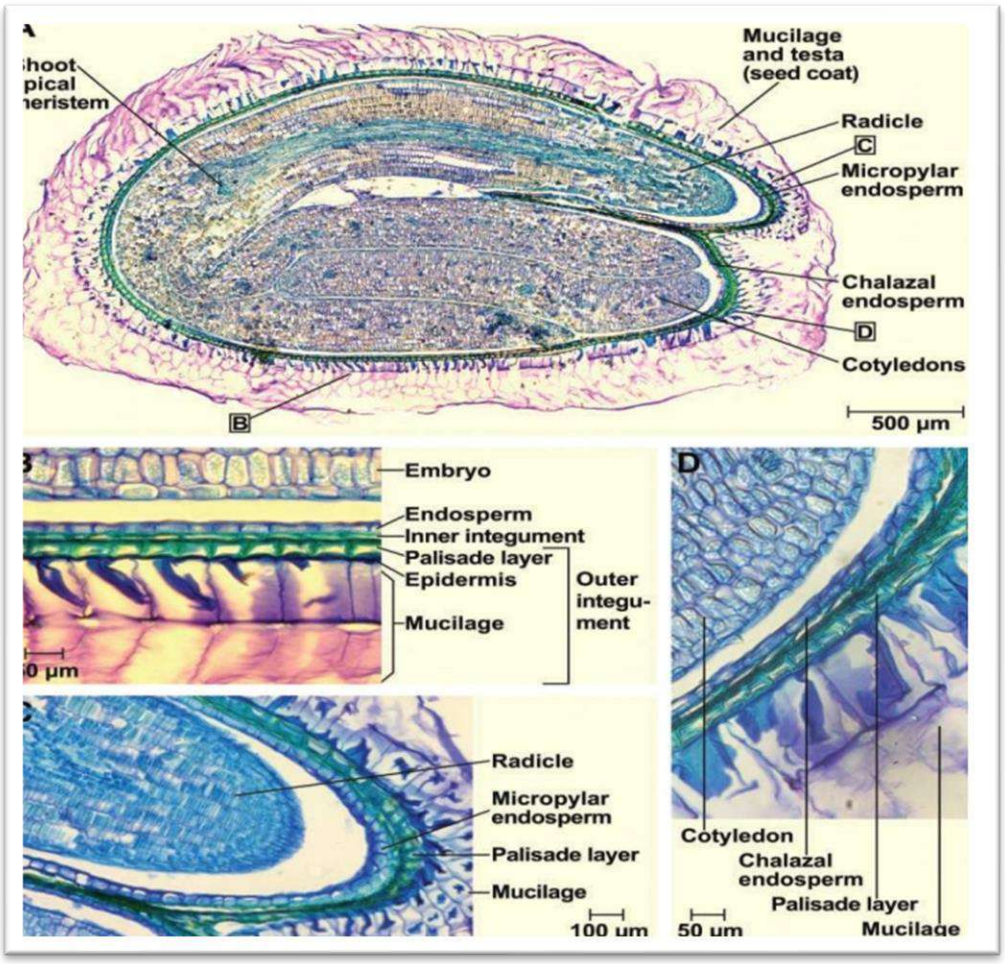
Ligustrum sativum L. is a herb that belongs to the Brassicaceae (Cruciferae) family and is edible. All throughout Asia and Europe, L. sativum is grown as a culinary vegetable. It is a glabrous, upright herb that blooms every year. It is widely grown in all temperate regions of india and Pakistan. The morphology of L. sativum seeds is comparable to that of seed oil, with the embryo making up 2-4% of the seeds, the dicotyledonous endosperm making up 82–85% of the seed content, and the seed coat making up 12–18%. This plant is glabrous, upright, and branching. Its height is close to sixty centimetres. Its upper leaves are normally entire, 2-3 cm long, oblanceolate, sessile, and have lobes that range in size from 0.7-1.2-0.3-0.6 cm. Its leaves are either entirely dissected or pinnately divided, and they are frequently lobed in different ways with linear segments. Racemes are axillary and terminal, measuring 7–15 cm; white or pale pink blooms have pedicels that are 3–5 mm long. Its round, obovate or broadly elliptical pods are emarginated and have thick, slightly winged wings above.

TAXONOMICAL CLASSIFICATION

Kingdom: Plantae;
Subkingdom: Tracheobionta;
Super division: Spermatophyta;
Division: Magnoliophyta;
Class: Magnoliopsida;
Subclass: Dilleniidae;
Order: Capparales;
Family: Brassicaceae;
Genus: Lepidium L.;

Species: Lepidium sativum [7-8]

MICRCOSCOPIC STRUCTURE



CHEMICAL CONSTITUENTS

Lepidium sativum L. leaves contain the following chemical components: 2.2% mineral matter, 0.11% phosphorus, 0.36% calcium, 1.0% fat, 8.7% carbs, 5.8% protein, and 82.3% water. Additionally, it has trace amounts of iron (28.6 mg/100 g), cobalt (12 µg/kg), iodine (110 µg/kg), and nickel (40 µg/kg). Cooked leaves have been shown to contain a small amount of vitamins, including 3.300 IU of vitamin A, 0.15 mg of riboflavin, 70 µg of thiamin, 39 mg/100 g of ascorbic acid, and 0.08 mg of niacin. The primary basic secondary chemicals in this plant are called glucosinolates. Through steam distillation, it yields 0.115% cress oil with a strong aroma and varying concentrations of benzyl cyanide and benzyl isothiocyanate. The volatile substance reports anti-bacterial activity against Bacillus subtilis and Micrococcus pyrogenes var. aureus. According to reports, crushed leaves of garden cress produce volatile compounds that include Bacillus subtilis. The entire garden cress seed contains 25–39% protein, which makes it a recommended food for promoting health. It is a useful raw material for food since it also includes 2.4% crude fat, 6.4% minerals, 33% carbs, 7.6% crude fibre, and 0.723% phosphorus. Because of its distinct perfume, peppery flavour, and tangy nature, it also plays a role in the culinary business. Furthermore, its sprouts are used as a more widely used element in salads and sandwiches in the majority of the regions, In a recent experimental study, the amount of ascorbic acid.[9]

MATERIALS AND METHODS

Lepidium sativum dried seeds were purchased from a nearby grocery store, and all other compounds utilised were of analytical quality Flaxseeds and Lepidium sativum seeds were gathered from the neighbourhood market in Tripoli, Libya. The faculty of sciences' botany department's herbarium verified the authenticity of the gathered seeds.[10]

Extraction METHODS

METHOD A

The 100 g of seeds were steeped in 1 litre of distilled water for 12 hours as part of the first process (method A). Next, the mucilage was separated using a vacuum pump. The leftover particle matter was then separated by going through muslin fabric. Following separation, acetone was applied to the transparent substance. To obtain mucilage that has precipitated For six hours, drying was done at 45°C. After that, the powder was weighed and run through an 80-mesh screen to determine the yield.

METHOD B

The 100 g of seeds were steeped in 1 litre of distilled water for 12 hours as part of the second process (method B). Next, the mucilage was separated using a vacuum pump. The leftover particle matter was then separated by going through muslin fabric. Ethanol was then applied to the isolated clear substance. to obtain mucilage that has precipitated. For six hours, drying was done at 45°C. After that, the powder was weighed and run through an 80 mesh screen to determine the yield.

METHOD C

The third process (method C) involved boiling 100 g of seeds in 1 litre of distilled water for 15 minutes, after which the mixture was filtered through a Bucknewithout filter paper. The retained residues were boiled with distilled water (0.5 litre) for 15 minute and the combined liquid was passed through eight folds of muslin cloth. The mucilage was precipitated from the filtrate by adding ethanol. The precipitated mucilage was dried in an oven at 45°C till it was completely dried. The powder was passed through 80 # mesh sieve and weighed to calculate the yield.[11]

PHYSICAL PARAMETERS

1. COLOUR- REDDISH-BROWN
2. SHAPE-OVAL
3. TASTE-PEPPERY,PUNGENT TASTE WITH HOT MOUTH FEEL
4. LENGTH-2.60mm
5. WIDTH-1.20mm
6. THICKNESS-0.94mm
7. Melting range- Decomposes above 2000 degreec
8. PH -(1%w/v) Neutral.
9. Loss on drying- 7%
10. Ash value- 4.5%
11. Acid insoluble ash-. 0%
12. Swelling index -18
13. Test for Carbohydrate (Mollish test) - + positive
14. Test for Tannins (Ferric chloride test) – negative
15. . Test for chloride- (Silver-nitrate test) – negative
16. Test for Sulphate- (Bariumchloride test) – negative
17. Uronic acid test +
18. Test for foreign matter- NMT 0.1 %
19. Test for heavy metal as lead - 20-25 ppm
20. Test for Arsenic. Less than 1 ppm.
21. Total ash- 4.5%
22. Acid insoluble ash- 0% (absence of sandy matter.)
23. Sulphated ash- 0.95
24. Solubility- Soluble in lukewarm water, Practically insoluble in ethanol, acetone, ether, and chloroform
25. Swelling index in distilled water- 18.0

26. Loss on drying 7%
27. Angle of repose 320
28. Bulk density 0.58 gm/cc
29. Tapped density 0.69 gm/cc [12]

ANTIMICROBIAL ACTIVITY OF LEPIDIUM SATIVUM AGAINST SOME GRAM POSITIVE AND GRAM NEGATIVE BACTERIA AND FUNGI.

INTRODUCTION

The earliest known forms of medicine are herbal ones. All cultures have used herbs throughout history, and they are now widely used in healthcare. Despite the fact that herbal and pharmaceutical treatments differ in a number of ways, herbal medicine needs to be evaluated for efficacy using traditional trial methodology, and some herbal extracts have been shown to be effective for particular conditions Medicinal plant products have been shown to be helpful in achieving good general health, extending longevity, and reducing the side effects of many chemotherapy drugs .It makes sense, then, that interest in plant medicine has grown during the past few decades on a global scale[13] Lepidium sativum (cress garden) and Allium porrum (leek), along with their juices, have antibacterial properties that have been studied on both Gram positive and Gram negative bacteria (Klebsiella pneumoniae, Proteus, Pseudomonas aeruginosa, Staphylococcus aureus, and Streptococcus mutans). Using the well diffusion technique, all the germs used in this study were acquired from human infections at the Hawlery Ferkary Hospital in Erbil City, Iraq. With the exception of Klebsiella pneumoniae, all of the bacteria under investigation were found to be inhibited by the extracts of both plants, whereas the bacteria were not affected by the juices of either plant. For Klebsiella pneumoniae and Proteus, the minimum inhibitory concentration (MIC) of L. sativum extracts was found to be 3%, whereas other These bacteria were not affected in any way by the juices of either plant. For Klebsiella pneumoniae and Proteus, the minimum inhibitory concentration (MIC) of L. sativum extracts was found to be 3%; however, all concentrations of the extracts exhibited no effect on other bacterial species. While K. pneumoniae and Proteus were insensitive to all concentrations, S. mutans was sensitive to all concentrations; the MIC of the ethanolic extract of A. porrum was 8% for S. aureus and 9% for P. aeruginosa. Unlike other bacteria, K. pneumoniae and Proteus were not affected by the MIC of the aqueous extract of Alllium porrum.

ANTIMICROBIAL ASSAY

1. **Fresh seeds of Lepidium Sativum**

acquired at the Omdurman Market pharmacy store. Prior to the extraction process, which involved washing the Lepidium sativum seeds in distilled water and blending them using a mortar and pestle, the seeds were kept in an airtight container. After that, 100 ml of 100% solvents (ethanol, hexane, chloroform, and water) were added to the ground seeds. Whatman No. 1 filter paper was used to filter the suspension. After being evaporated, the filtrate was ground into a powder. Minimal Dimethyl Sulfoxide quantity (DMSO) was added in the above obtained powdered extract. Different dilutions of the extract were prepared for antimicrobial assay; dilutions were conducted from crude, water residue, hexane, chloroform and ethanol as 100 (10%), 50 (5%), 25 (2.5%), 12.5 (1.25%), 6.25 (0.6%), 3.12 (0.3%), 1.56 (0.2%) and 0.78 (0.08%) mg/ml, those dilutions for minimum inhibitory concentration (MIC), which assessed visually depending in color changes. And minimum bacterial concentration (MBC) it conducted by subculture of each extract dilution and determined by which no growth (blue color) on plate that contained Mueller Hinton agar, MBC is the concentration that inhibited growth the organism

2. Microorganisms Used for Antimicrobial Assay

Escherichia coli , Staphylococcus aureus , Enterococcus faecalis , Pseudomonas aeruginosa , and Klebsiella pneumoniae ; while Salmonella paratyphi B (from stool sample) and Candida albicans (from urine sample) were clinical isolated organisms. Cultures used for antimicrobial assay were obtained from Khartoum National Health Laboratory. Microbial inoculums was be standardized at 0.5 McFarland standards.

3. Agar Well Diffusion Assay

molar Hinton agar was the base of the culture, inoculation of the microorganisms took place first, then using metal porer, different pores were conducted to enable filling with exact extract dilution to be added, which was 50microliter in each pore from each solvent. Antimicrobial activity of plant extracts was screened against E. coli, S. aureus, E. faecalis, P. aeruginosa, K. pneumoniae, S. paratyphi B and C. albicans using the agar well diffusion assay. Microbial inoculum was aseptically spread on the surface of pre solidified Mueller Hinton agar plates using a spreader.[15]

4. **Well diffusion technique**

Via the well diffusion approach, antibacterial activity was evaluated A volume of 0.1 milliliters was used to seed each examined organism's inoculum onto the Nutrient Agar (NA) plates. Using a loop, the inoculums were distributed uniformly across the plates. On the surface of the NA, uniform wells were drilled using a standard 8-mm cork borer, and 100 µl of each concentration of plant extracts or juices was added to the well. Following a 24-hour incubation period at 37°C, the zones of inhibition were measured to the closest millimeter (mm).

5. Preparation of inoculum

Each studied organism was grown in two to three colonies, and each colony was moved to a 5cc nutrient broth. The broths were kept at 37°C for a whole night.

6. Agar dilution method

With a small modification, the NCCLS-approved agar dilution procedure was used. A dilution sequence of every extract ranging in NA ranging from 10% (v/v) to 1% (v/v). The streak method was used to inoculate the plates with bacterial suspensions after the media had solidified. For 24 hours, inoculated plates were incubated at 37°C. After 24 hours, the lowest concentration of the extract that prevented each organism from growing visibly on the agar plate was identified as the minimum inhibitory concentration, or MIC. It was ignored if there were one or two colonies . Every experiment was carried out in three copies.[16]

RESULT AND DISCUSSION

This experimental study conducted on L. sativum effect on certain microorganisms, as it used as base of growth media, antimicrobial activity can be presented with increasing the zone of clearance, which indicate the effect occurred though, as diameter more than 12 mm would be considered as a sensitive. Five different solutions were used as solvents for the extract of L. sativum seeds, crude, water residue, Hexane, chloroform and ethanol, with different concentrations of seeds, the result showed that more effective readings or growth was obtained through the dilution 50 mg/ml, which revealed different zones in cultured media with different organisms, high zone diameters obtained with E. Coli and K. Pneumoniae as 16mm, and then decline zone diameters until 7mm which obtain by the C. albicans. With the exception of K. pneumoniae, every bacterial species tested shown susceptibility to ethanolic and aqueous extracts of the two plants under investigation. Additionally, it was shown that the ethanolic extracts of both plants had superior antibacterial activity compared to the aqueous extracts. This might be explained by variations in the active compounds' activities

when extracted using different solvents statistical analysis findings also revealed a significant difference ($p<0.05$). K. pneumoniae shown resistance to every extract. This has also been seen in earlier studies, where K. pneumoniae was shown to be resistant to every extract employed in the investigations, including A. porrum. This could be explained by K. pneumoniae having a capsule. a structure that shields it from the effects of plant extracts or stops them from entering the inside of the cell. L. sativum has greater antibacterial activity than A. porrum, and reports that have been published indicate that A. porrum has very little antimicrobial activity The current result indicates that L. sativum extracts, particularly the ethanolic extract, exhibited the highest level of antibacterial activity. These findings are consistent with those of previous studies When tested against the germs in the study, the juices of both plants exhibited negligible antibacterial action[17] The agar dilution method was used to determine the minimum inhibitory concentration (MIC) The minimum inhibitory concentration (MIC) of both L. sativum extracts against K. pneumoniae and Proteus was determined to be 3%. Conversely, all doses of both extracts exhibited sensitivity against other bacterial species. In contrast to S. mutans, which was impacted by all concentrations of the ethanolic extract of A. porrum, K. pneumoniae and Proteus were insensitive to all concentrations of the extract, while the MIC of the extract was 8% against S. aureus and 9% against P. aeruginosa. Compared to other bacterial species, K. pneumoniae and Proteus were not affected by the MIC of the aqueous extract of A. porrum. Negative outcomes, however, do not imply that the plant is inactive or that the bioactive components are missing. The amount of active chemicals in the crude extracts may not be sufficient to display the inhibitory effect, hence the dose levels used would not be adequate. Therefore, the only way to demonstrate the absence of inhibitory effect is to use high doses. Alternatively, even if the active principle is present in sufficient amounts, additional components may have an antagonistic effect on the beneficial effects of the bioactive molecules, negating the principle's antibacterial activity. Furthermore, it's possible that the extracts work against untested bacterial species as well .

It is determined that the antibacterial activity of both plant extracts G+ and G-bacteria; more research in this area is necessary.[18]

Extract	S. aureus	E. faecalis	E. coli	K. pneumoniae	P. aeruginosa	S. paratyphi	C. albicans
Crude	10	13	16	11	9	8	-
Water	12	-	15	9	8	10	12
Hexane	11	12	14	16	13	12	7
Chloroform	15	11	-	12	14	11	12
Ethanol	14	8	11	11	13	-	-

1. Antimicrobial activity of seeds of Lepidium sativum extracts

Extract	S. aureus		E. faecalis		E. coli		K. pneumoniae		P. aeruginosa		S. paratyphi		C. albicans	
	MIC	MB	MIC	MB	MIC	MB	MIC	MB	MIC	MB	MIC	MB	MIC	MB

		C		C		C		C		C		C		C
Crude	12.5	25	3.12	25	25	50	50	NIL	25	NIL	50	NIL	NIL	NIL
Water	25	50	NIL	NIL	3.12	6.25	12.5	25	NIL	NIL	25	50	12.5	50
Hexane	50	Nil	50	Nil	12.5	25	3.25	12.5	12.5	50	6.25	25	50	50
Chloroform	3.12	12.5	12.5	50	Nil	Nil	25	50	6.25	25	12.5	50	25	50
Ethanol	3.12	6.25	6.25	25	6.25	12.5	25	Nil	3.12	12.5	Nil	Nil	Nil	Nil

Minimum inhibitory concentration (MIC) and minimum bacterial concentration (MBC) for each microorganism .

2.MIC and MBC among different dilutions[19]

Concentration of plant extract	*Zone of inhibition in mm				
	Klebsiella pneumoniae	*Proteus spp.*	*Pseudomonas aeruginosa*	*Staphylococcus aureus*	*Streptococcus mutans*
100%	-	16	17	19	18
75%	-	15	15.5	15	15
50%	-	13	15	13	12
25%	-	-	13	11	9
12.5%	-	-	-	-	8
LSD	Non significant	3.52	4.21	3.47	6.57

3. Antibacterial activity of ethanolic extract of Lepidium sativum.

Concentration of plant extract	*Zone of inhibition in mm				
	Klebsiella pneumoniae	*Proteus spp.*	*Pseudomonas aeruginosa*	*Staphylococcus aureus*	*Streptococcus mutans*
100%	-	13	15	16	16
75%	-	-	11	11	9
50%	-	-	-	-	8
25%	-	-	-	-	-
12.5%	-	-	-	-	-
LSD	Non significant	1.15	7.84	4.62	3.27

4. Antibacterial activity of aqueous extract of Lepidium sativum

Concentration of plant extract	*Zone of inhibition in mm				
	Klebsiella pneumoniae	*Proteus spp.*	*Pseudomonas aeruginosa*	*Staphylococcus aureus*	*Streptococcus mutans*
100%	-	-	15.5	17	-
75%	-	-	12	13	-
50%	-	-	10	-	-
25%	-	-	-	-	-
12.5%	-	-	-	-	-
LSD	Non significant	Non significant	3.88	8.10	Non-significant

5: Antibacterial activity of ethanolic extract of Allium porrum

Concentration of plant extract	Zone of inhibition in mm				
	Klebsiella pneumoniae	*Proteus spp.*	*Pseudomonas aeruginosa*	*Staphylococcus aureus*	*Streptococcus mutans*
100%	-	-	15	17	17
75%	-	-	13	15	14
50%	-	-	-	-	-
25%	-	-	-	-	-
12.5%	-	-	-	-	-
LSD	Non significant	Non significant	3.65	3.65	2.31

6. Antibacterial activity of aqueous extract of Allium porrum.[20]

A STUDY OF METHANOL SEED EXTRACT OF LEPIDIUM SATIVUM EFFECT ON SOME ENTEROBACTERIA AND

Bacteria and Fungi

1. **Staphylococcus:**

are scarce, resistant to heat and drainage, and able to cling to fomites for extended periods of time before reaching their target. Regular washing reduces the spread of staphylococcal bacteria before and after handling food or possibly sick people.

2. **Klebsiella:**

are big, immobile bacteria that, in those who are impaired by alcohol, can cause necrotizing lobar pneumonia. Because they have a luxuriant capsule, they can also cause diabetes, chronic obstructive pulmonary disease, urinary tract infections, and bacteremia, especially in hospitalized patients.

3. **E. coli:**

While it is a natural component of the flora in both humans and animals, it can also be harmful both inside and beyond the gastrointestinal system. Bloody stools and a fever are symptoms of E. coli that may resemble dysentery. Additionally, it affects young children by causing persistent diarrhea and traveler's diarrhea.

4. **Enterococcus faecalis:**

A recurring source of a wide range of infections in humans are enterococci. In endodontic infections such as obturator root canals with chronic apical periodontitis, Enterococcus faecalis has been eliminated. The organism can withstand extreme hardship and still survive. Acquiring knowledge about the creature Richard could help to justify endodontic handling errors.

5. **Asparagillus niger:**

This fungus, which is a member of the Euascomycetes class, spreads around the world in both terrestrial and aquatic environments. It reproduces by means of spores that are present all year long. It finds application in a variety of industries, including the food and pharmaceuticals industries. This strain can be harmful to people and cause respiratory discomfort, particularly in those with weakened immune systems. The species Aspergillus spp.[21]

METHOD

Antifungal activity test: Plant extract examined at three concentrations for Aspergillus niger at (1, 0.5, 0.12) mg to assess antifungal activity in petri plates with 15 ml of sterilized potato dextrose agar when seven days of incubation at 27 °C is gown the Aspergillusnigerradial growth of mycelium wasmeasured the actively growing mycelium 5 mm diameter of the disc of the pathogen with negative control the results were compared the following formula used for calculate percentinhibition of the fungus in treatment: L = [(C – T)/C] x 100 The L is refer to percent inhibition C is represent the colony radius in control plate and T is the radial growth of the pathogen in the presence of plant extracts Shivapratap .[22]

RESULT AND DISCUSSION

Antibacterial Activity Study

The results in table 1 indicated the effect of methanol seed extract at concentration of (200mg/ml) there was a variation among L. sativum in the antibacterial activity of the methanol seed extract against the studied bacteria, in the diameter of inhibition zone with diver's bacterial strain Staph. aureus gave the highest inhibition zone value was (26mm) at1ml of L. sativum methanol seed extract while E. coli and E. faecelis not gave any inhibitionzone at 0.12 ml of L. sativum methanol seed extract results also indicated in There was variation among gram negative and positive bacteria in their response different solvent seed extract, this might be attributed to the difference in the bioactive compounds generally, gram negatives are more resistant than gram-positive as reported in many studies Kluytmans.

Wu et al (2020) reported that the wide range of antimicrobial activity of essential oils because of its complex chemical composition variation in susceptibility among gram-negative and gram-positive related mainly to differing structures of cell walls of bacteria the main cause of alterations in cell's structure and functional is hydrophobic nature of the essential oils which allows them to penetrate microbial cells.[23]

CONCLUSION

Methanol seed extract was effectively bearing antibacterial and antioxidant activity its necessary to conduct screening study for phytochemicals isolation and examining them to determine the most effective phytochemical potency for pharmaceutical purpose. More searches are needed for isolation and identification of others microorganism like anaerobic bacteria, fungi and virus.[24]

A Study of Methanol Seed Extract of Lepidium Sativum Effect on Some EnteroBacteria and Fungi (Asparagillus Niger)

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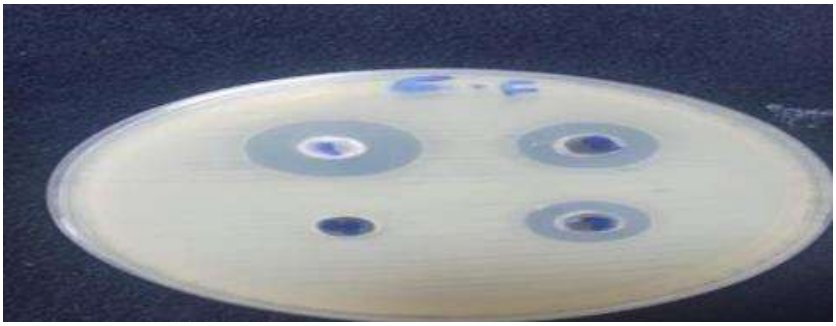
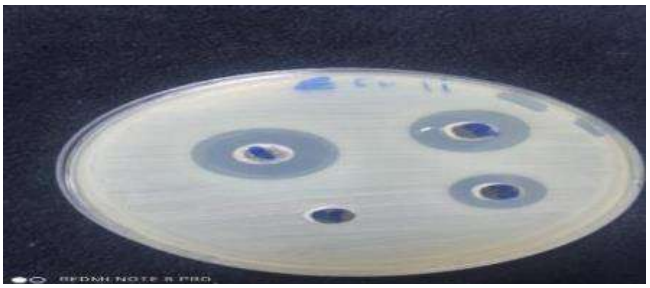
Antibacterial effect of methanol L. sativum seed extract

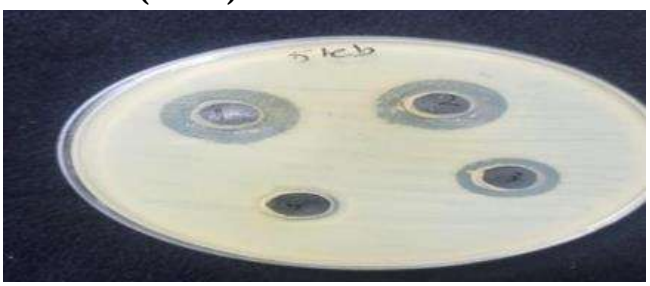
Extract Bacteria	Seed 1ml	Seed 0.5	Seed 0.25	Seed 0.12
Staph. aureus	26 mm	24mm	18mm	15mm
Kleb. pneumonia	22mm	20 mm	16mm	11mm
E. coli	20mm	18 mm	15mm	-
E.faecelis	19mm	17mm	15mm	-



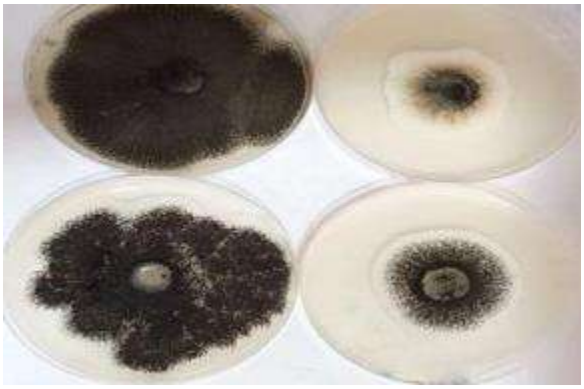
Antibacterial effect (E.faecelis) on the L. sativum methanol seed extract



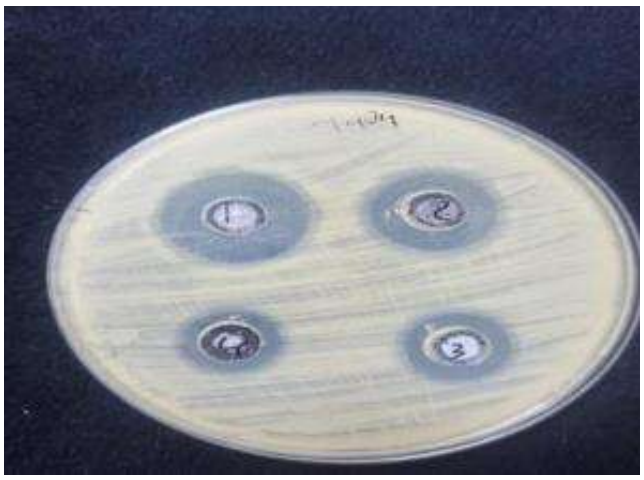
Antibacterial effect (E.coli) on the L.sativum methanol seed extract



Antibacterial effect (klebsiala) on the L.sativum methanol seed extract



Anti fungi (Aspergillus niger) effect of L. sativum methanol seed extract Antioxidant Activity Using DPPH Assay



Antibacterial effect (staphylococcus) on the L. sativum methanol seed extract[25-26]

REFERENCE:

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