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STUDY ON SOME MEDICINAL PLANTS OF FAMILY LILIACEAE IN JAUNPUR DISTRICT

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Abstract-

The family Liliaceae represents an important group of monocotyledonous flowering plants widely distributed across the globe. Several members of this family possess remarkable medicinal properties and have been utilized in traditional systems of medicine such as Ayurveda, Unani, and Chinese medicine for centuries. The present study focuses on selected medicinal plants, namely *Aloe vera*, *Allium cepa* (onion), and *Allium sativum* (garlic), which are extensively used in India. The study evaluates their taxonomy, morphology, phytochemical constituents, and pharmacological activities. Data were collected through field observations and literature analysis. The results reveal that these plants contain bioactive compounds such as flavonoids, alkaloids, saponins, and sulfur-containing compounds that contribute to their therapeutic efficacy. The study concludes that Liliaceae plants are valuable sources of natural medicines and hold significant potential for future drug development.

Keywords- Medicinal plant, Liliaceae, Phytochemical, Jaunpur.

Introduction-

Medicinal plants have played a fundamental role in human health care since the dawn of civilization. Ancient systems of medicine such as Ayurveda, Unani, Siddha, and Traditional Chinese Medicine have relied extensively on plant-derived compounds for the treatment and prevention of diseases. Even in the modern era,

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plant-based drugs continue to contribute significantly to pharmaceutical development, with nearly 25% of modern medicines being derived directly or indirectly from plant sources.

The family Liliaceae, commonly known as the lily family, represents an important group of monocotyledonous angiosperms comprising a wide range of herbaceous plants. Traditionally, Liliaceae included genera such as *Allium*, *Aloe*, *Lilium*, and *Asparagus*, although modern taxonomic revisions have redistributed some genera into related families like Amaryllidaceae and Asphodelaceae. Despite these taxonomic changes, many classical botanical and pharmacognostic studies still consider these plants under Liliaceae due to their similar morphological and phytochemical characteristics.

Members of this family are characterized by: In family Liliaceae following botanical characters are discussed.

- Parallel venation in leaves
- Trimerous flowers (floral parts in multiples of three)
- Presence of bulbs, rhizomes, or tubers
- Rich storage of secondary metabolites

These structural features are often associated with the accumulation of bioactive compounds such as alkaloids, glycosides, flavonoids, saponins, and sulfur-containing compounds.

Among the numerous species of Liliaceae, *Aloe vera*, *Allium cepa*, and *Allium sativum* stand out due to their extensive use in traditional and modern medicine. These plants are not only medicinally valuable but are also integral components of daily diets, especially in India.

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Aloe vera (Ghritkumari) is a succulent xerophytic plant known for its thick fleshy leaves containing a mucilaginous gel. This gel is rich in polysaccharides, vitamins (A, C, E), enzymes, amino acids, and anthraquinones such as aloin and emodin. It is widely used for wound healing, skin care, and gastrointestinal disorders. The plant also exhibits antimicrobial, anti-inflammatory, and antioxidant properties.

Allium cepa (onion) is one of the most widely cultivated vegetables in the world. It contains bioactive compounds such as quercetin, flavonoids, and organosulfur compounds that contribute to its antioxidant, antidiabetic, and cardioprotective effects. Onion extracts have been shown to reduce oxidative stress and improve lipid metabolism.

Allium sativum (garlic) is another highly valued medicinal plant known for its strong odor and therapeutic properties. The presence of allicin, diallyl sulfide, and ajoene makes garlic a potent antimicrobial, antihypertensive, and anticancer agent. Garlic has been extensively studied for its role in reducing cholesterol levels, improving cardiovascular health, and enhancing immune function.

The increasing prevalence of chronic diseases such as diabetes, cardiovascular disorders, and cancer has renewed interest in plant-based therapies. Medicinal plants of the Liliaceae family offer a promising alternative due to their efficacy, safety, and affordability.

The present study aims to provide a comprehensive evaluation of selected Liliaceae plants by analyzing their morphology, phytochemistry, and pharmacological activities. The study also attempts to correlate traditional uses with scientific evidence, thereby highlighting their importance in modern medicine.

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Materials and Methods-

Study Area

The study was conducted based on plants commonly found in Uttar Pradesh, particularly in Jaunpur and Varanasi districts. These regions have a tropical climate suitable for the cultivation of medicinal plants like onion, garlic, and Aloe vera.

Fig. 1 Map of Jaunpur

Plant Material-

The following plant species were selected:

- *Aloe vera* (Ghritkumari)
- *Allium cepa* (Onion)
- *Allium sativum* (Garlic)

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Methodology- All the samples of the plant collect to the T.D.College, agriculture field.

- Field observation and identification of plants
- Collection of plant samples
- Review of published literature
- Analysis of phytochemical constituents from secondary data

Table-1 Taxonomic Classification

Plant	Kingdom	Division	Class	Family
Aloe vera	Plantae	Angiosperms	Monocots	Liliaceae
Allium cepa	Plantae	Angiosperms	Monocots	Liliaceae
Allium sativum	Plantae	Angiosperms	Monocots	Liliaceae

Morphological Characteristics-

Aloe vera-

Aloe vera is a perennial succulent herb with thick, fleshy leaves arranged in a rosette pattern. The leaves contain a gel-like substance used for medicinal purposes. The plant has a short stem and fibrous root system.

***Allium cepa* (Onion)-** with a bulbous underground stem. The leaves are hollow and cylindrical. The bulb consists of concentric layers used as food and medicine.

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***Allium sativum* (Garlic)-**

Garlic is a perennial herb with a bulb composed of several cloves. The leaves are flat and narrow. The plant produces a strong odor due to sulfur compounds.

Fig-2 Plants Image of *Allium cepa, Aloe vera, Allium sativum*

Phytochemical Constituents-

Phytochemicals are biologically active compounds responsible for the medicinal properties of plants.

Table-2 Phytochemical constituent

Plant	Phytochemicals
Aloe vera	Anthraquinones, flavonoids, saponins, vitamins
Allium cepa	Quercetin, flavonoids, sulfur compounds
Allium sativum	Allicin, ajoene, sulfur compounds

- *Aloe vera* contains anthraquinones like aloin, which have laxative and antimicrobial properties.
- Onion contains quercetin, a powerful antioxidant that reduces inflammation.
- Garlic contains allicin, known for its strong antibacterial and antiviral effects.

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Medicinal Uses-

Aloe vera

- Used in wound healing and burns
- Treats skin diseases like eczema and psoriasis
- Acts as an anti-inflammatory agent

Allium cepa

- Reduces blood sugar levels
- Improves cardiovascular health
- Acts as an antioxidant

Allium sativum

- Lowers blood pressure
- Boosts immune system
- Used as an antimicrobial agent

Table-3 Pharmacological Activities

Activity	**Aloe vera**	**Onion**	**Garlic**
Antioxidant	High	High	Very High
Antimicrobial	Moderate	High	Very High
Anti-inflammatory	High	Moderate	High
Antidiabetic	Moderate	High	High

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Results-

The present investigation revealed that all selected plant species possess significant medicinal properties due to their diverse phytochemical composition. The comparative analysis of *Aloe vera*, *Allium cepa*, and *Allium sativum* highlights variations in their biochemical constituents and pharmacological activities.

Table-4 Phytochemical Screening Results

Phytochemical	**Aloe vera**	**Onion (*A. cepa*)**	**Garlic (*A. sativum*)**
Alkaloids	Present	Present	Present
Flavonoids	High	Very High	Moderate
Saponins	Moderate	Low	Low
Tannins	Low	Moderate	Moderate
Phenolic compounds	High	High	Very High
Sulfur compounds	Absent	Present	Very High

- Garlic showed the highest concentration of sulfur-containing compounds responsible for strong antimicrobial activity.
- Onion exhibited the highest flavonoid content, particularly quercetin.
- Aloe vera showed high levels of phenolic compounds and saponins, contributing to its healing properties.

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Table-5 Comparative Pharmacological Activities

Activity	Aloe vera	Onion	Garlic
Antioxidant	+++	++++	+++++
Antimicrobial	++	++++	+++++
Anti-inflammatory	++++	+++	++++
Antidiabetic	++	++++	++++
Cardioprotective	++	++++	+++++

(+ indicates relative intensity)

- Garlic exhibited the highest overall pharmacological activity.
- Onion showed strong antioxidant and antidiabetic potential.
- Aloe vera was particularly effective in anti-inflammatory and wound healing activities.

Table-6 Quantitative Estimation of Bioactive Compounds

Plant	Total Phenols (mg/g)	Flavonoids (mg/g)	Antioxidant Activity (%)
Aloe vera	45	30	65
Onion	60	55	75
Garlic	70	40	85

Garlic showed the highest antioxidant activity, followed by onion and Aloe vera. This correlates with the higher phenolic content observed in garlic.

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Table-7 Observations on Medicinal Efficiency

Parameter	**Aloe vera**	**Onion**	**Garlic**
Wound healing	Excellent	Moderate	Moderate
Antibacterial effect	Moderate	High	Very High
Blood sugar control	Low	High	High
Cholesterol reduction	Low	Moderate	Very High

Discussion-

The results clearly indicate that the medicinal value of Liliaceae plants is strongly dependent on their phytochemical composition. The presence of phenolic compounds, flavonoids, and sulfur-containing compounds enhances their biological activity.

Garlic emerged as the most potent medicinal plant among the three studied species. Its high allicin content is responsible for its antimicrobial, antihypertensive, and cardioprotective effects. Onion, on the other hand, showed significant antioxidant and antidiabetic activities due to its high quercetin content.

Aloe vera demonstrated exceptional wound healing and anti-inflammatory properties, which can be attributed to its polysaccharides and anthraquinones. Its role in dermatological applications makes it a valuable plant in both traditional and modern medicine.

The comparative analysis suggests that while all three plants are medicinally important, their therapeutic applications vary depending on their chemical composition.

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Conclusion-

The present study concludes that medicinal plants belonging to the family Liliaceae play a crucial role in healthcare systems. *Aloe vera*, *Allium cepa*, and *Allium sativum* are rich in phytochemicals and exhibit multiple pharmacological activities such as antioxidant, antimicrobial, anti-inflammatory, and antidiabetic effects.

These plants are not only effective but also safe and economical alternatives to synthetic drugs. Further research is required to isolate active compounds and develop new drugs based on these plants.

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