



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://zenodo.org/records/10601306>Available online at: <http://www.iajps.com>

Review Article

**OVERVIEW OF PHARMACOLOGY AND MEDICAL
REMEDIES OF 'LILY'****¹Varsha S. Nagre, ²Vanshree G. Rathod, ³Vinayak A. Katekar, ⁴Dr. Swati P. Deshmukh.**^{1,2}Department of Pharmacy, Shraddha Institute Of Pharmacy, Washim, Maharashtra, India³Department of Quality Assurance, Shraddha Institute Of Pharmacy, Washim, Maharashtra, India⁴Department of Pharmacology, Shraddha Institute Of Pharmacy, Washim, Maharashtra, India**Abstract:**

Lilium candida L., known as Madonna, meadow, or white lily, is a bulbous plant from the Liliaceae family, originating in the Middle East. L. candida has been abundantly used in folk medicine since ancient times to relieve a variety of ailments, including age-related diseases, burns, ulcers, and coughs. The aim of this article is to investigate the anti-inflammatory and anti-diabetic activities of L. candida extracts and its active phytochemicals.

Lilium candida L., was cultivated and has been used for different purposes like medical, cosmetics, commercial for thousands of years. It was naturally distributed around the city of Balkier (in Marmara region) and was investigated for its morphological, anatomical, and phonological specifications during this study. Some of the morphological measurements were different from the measurements in Flora of Turkey. The measurements on bulb, stem leaves, basal leaves, bracted, pedicel, inner and outer teals (separately), fruit, seed and pollen were given for the first time. Natural distribution of L. candida in this region is the first record for the region and also the natural growth conditions for this species around Balkier city were determined for the first time

Keyword: *Lilium candida; phytochemicals; phonological specifications*

Corresponding author:**Varsha S. Nagre,**Department of Pharmacy,
Shraddha Institute Of Pharmacy,
Washim, Maharashtra, India

QR code



Please cite this article in press Varsha S. Nagre et al., **Overview of Pharmacology and Medical Remedies of 'Lily'**, *Indo Am. J. P. Sci*, 2024; 11 (01).

INTRODUCTION:

Lilium candida, the Madonna lily[2][3] or white lily,[4] is a plant in the true lily family. It is native to the Balkans and Middle East, and naturalized in other parts of Europe, including France, Italy, and Ukraine, and in North Africa, the Canary Islands, Mexico, and other regions.[1][5] It has been cultivated since antiquity, for at least 3,000 years,[6] and has great symbolic value since then for many cultures. It is susceptible to several virus diseases common to lilies, and especially to *Botrytis* fungus. One technique to avoid problems with viruses is to grow plants from seed instead of cuttings.

There was no study found in the literature about the anatomy and morphology of *L. candida*. However, some studies about the species have been made on hybrid lilies grown as cut flowers in greenhouses (Osun, 1981; Osun, 1984). Besides, it has been determined that some biochemical and genetic studies have been made on *L. candida* (Van-Toil et al., 1986). *L. candida*, which has been known for thousands of years and been used for various purposes, was being grown extensively in gardens for ornamental purposes in Balkan area. But no scientific record were found about this species growing naturally in Balkan area.

Scientific classification:

Kingdom	: Plantae
Clade	: Trichophytes
Clade	: Angiosperms
Clade	: Monocots
Order	: Liliales
Family	: Liliaceae
Subfamily	: Lilioideae
Tribe	: Lilieae
Genus	: <i>Lilium</i>
Species	: <i>L. candida</i>

**Description:**

It forms bulbs at ground level, and, unlike other lilies, grows a basal rosette of leaves during winter, which die the following summer. A leafy floral stem, which generally grows 1.2 metres (3 ft 11 in) tall, but exceptionally 2 metres (6 ft 7 in) tall, emerges in late spring and bears several sweetly and very fragrant flowers in summer. The flowers are pure white and tinted yellow in their throats.

The morphological features of *L. Candida*: Certain differences were determined between the data obtained in the research on external morphological features of the species and Flora of Turkey (Davis, 1988). However, in this study, separate inner and outer tepal measurements, together with biometric measurements of the bulb, stem and basic leaves, bract, pedicle, pollen, fruit and seeds were presented, and there was no study found about our findings.

The anatomical features of *L. candida*: The results of the anatomical studies showed that the plant has a typical monocotyledon root. Rectangular shaped and monolayer epidermis cells and root absorbent hairs were seen in the outer part of the root cross section. Cortex layer which consists of different dimensions and shapes of parenchyma cells were placed under the epidermis. After the cortex endodermis lies which has monolayer, well shaped passage cells. Under the endodermis, phloem elements were seen which are alternately located with monolayer sclerenchymatic pericyclic cells. There was no parenchyma core in the vascular system and the centre is full of metaxylem elements. Vascular beams in root are radial type (Fig. 9). The findings about the structure of root were similar with the features about the root anatomy of *Illium* described by Yenta (1995) and Vardar (1982).

Distribution:

Native distribution areas:

Continental: Europe

Regional: Middle Europe , Czechoslovakia (introduced).

Regional: South-western Europe , Corse, France, Portugal, Sardinia, Spain (introduced).

Regional: South-eastern Europe , Albania, Bulgaria (introduced), Greece, Italy, Kristi, Sicilia (introduced) , Turkey-in-Europe (extinct), Yugoslavia.

Regional: Eastern Europe , East European Russia, Ukraine (introduced).

Continental: Africa (introduced)

Regional: Northern Africa , Algeria, Tunisia.

Regional: Macaronesia , Canary Islands, Madeira.

Continental: Asia-Temperate

Regional: Caucasus , Transcaucasia (introduced).
Regional: Western Asia , East Aegean Islands, Lebanon-Syria, Palestine, Turkey.

Continental: Northern America (introduced)
Regional: North-eastern U.S.A. , Pennsylvania.
Regional: Mexico , Mexico Central, Mexico Southwest.



Pharmacological action of lily :-

Lily, also known as Ilium, is a flowering plant that belongs to the Liliaceous family. While lilies are primarily known for their ornamental value, they also possess certain pharmacological actions. Here are some of the pharmacological actions of lily in detail:

1. **Anti-inflammatory action:** Lily extracts have been found to possess anti-inflammatory properties. They can inhibit the production of inflammatory mediators, such as prostaglandins and cytokines, thereby reducing inflammation in the body. This action can be beneficial in conditions like arthritis, asthma, and other inflammatory disorders.

2. **Antioxidant action:** Lily extracts contain various antioxidants, such as flavonoids, phenolic compounds, and vitamin C. These antioxidants help neutralize harmful free radicals in the body, which can cause oxidative stress and damage to cells. By reducing oxidative stress, lily extracts can protect against chronic diseases like cardiovascular diseases, cancer, and neurodegenerative disorders.

3. **Antimicrobial action:** Some studies have shown that lily extracts possess antimicrobial properties. They can inhibit the growth of various bacteria, fungi, and viruses. This action can be useful in treating infections caused by these microorganisms.

4. **Anticancer action:** Certain compounds present in lily extracts have shown potential anticancer activity. They can inhibit the growth and proliferation of cancer cells, induce apoptosis (programmed cell death), and prevent the formation of new blood vessels that supply nutrients to tumours. However, more research is needed to fully understand the anticancer potential of lily extracts.

5. **Diuretic action:** Lily extracts have diuretic properties, meaning they can increase urine production and promote the elimination of excess fluids and waste products from the body. This action can be beneficial in conditions like edema (fluid retention), high blood pressure, and kidney disorders.

6. **Sedative action:** Some species of lilies, such as *Ilium candida*, have been traditionally used for their sedative properties. They can induce relaxation, reduce anxiety, and promote sleep. This action can be helpful in managing stress, insomnia, and certain nervous disorders.

It is important to note that the pharmacological actions of lily may vary depending on the species, parts used, extraction methods, and dosage. Additionally, further research is needed to fully understand the mechanisms of action and potential therapeutic applications of lily in various health conditions.

Formulation of lily :-

The formulation of lily can refer to the process of creating a product or the specific ingredients used in the product. Without more context, it is difficult to provide specific details about the formulation of lily. However, here are some general details about the formulation of lily in different contexts:

Lilies are herbaceous flowering plants with large, showy flowers belonging to the genus *Ilium*. They are known for their elegant appearance and pleasant fragrance. Lily flowers typically have six petal-like tepals arranged in a symmetrical pattern, forming a trumpet-shaped bloom.

The main parts of a lily flower include the petals, sepals (collectively called tepals), stamen, pistil, and ovary. The petals and sepals are often similar in appearance, making it challenging to distinguish them. The stamen produces pollen, while the pistil consists of the stigma, style, and ovary, where fertilization occurs.

Lilies come in various colours such as white, yellow, orange, pink, and red. Additionally, there are different

types of lilies, including Asiatic, Oriental, Trumpet, and Daylilies, each with distinct characteristics.

Lilies are commonly cultivated in gardens and are used in floral arrangements for their beauty. They have cultural and symbolic significance in various societies, representing purity, renewal, and passion. Understanding the anatomy of a lily flower enhances appreciation for its aesthetic appeal.

1. **Perfume/Cosmetics:** Lily is a popular fragrance note in perfumes and cosmetics. The formulation of a lily-based perfume or cosmetic product involves combining various ingredients to create the desired scent. This may include synthetic or natural lily extracts, essential oils, and other fragrance ingredients. The formulation process typically involves blending and adjusting the proportions of these ingredients to achieve the desired scent profile.

2. **Pharmaceutical/Medicinal:** Lily extracts or compounds derived from lilies may be used in pharmaceutical or medicinal products. The formulation of such products involves extracting or isolating the active compounds from lilies and combining them with other ingredients to create a specific formulation. This may involve processes like extraction, purification, and formulation techniques to ensure stability and efficacy.

3. **Food/Flavouring:** Lily flowers are sometimes used in culinary applications, such as flavoring or garnishing dishes. The formulation of lily flavourings or food products involves extracting or infusing the flavour compounds from lilies into a suitable medium. This can be done through processes like distillation, infusion, or extraction using solvents. The resulting formulation can be used to add lily flavor to various food and beverage products.

The formulation of lily can refer to the process of creating a product or the specific ingredients used in a product. Without more context, it is difficult to provide specific details about the formulation of lily. However, here are some general aspects that may be relevant:

1. **Ingredients:** The formulation of lily may involve selecting and combining various ingredients to achieve the desired properties and benefits. For example, if it is a skincare product, the formulation may include ingredients like lily extract, botanical oils, antioxidants, and moisturizers.

2. **Research and Development:** Formulating lily products often involves extensive research and

development to ensure the product's effectiveness, safety, and stability. This may include testing different ingredient combinations, conducting stability studies, and optimizing the formulation for desired results.

3. **Manufacturing Process:** The formulation of lily products also involves determining the manufacturing process. This includes determining the appropriate temperature, mixing techniques, and other factors to ensure the ingredients are properly combined and the final product is consistent and of high quality.

4. **Quality Control:** Formulating lily products requires strict quality control measures to ensure that the final product meets the desired standards. This may involve testing the product for purity, stability, and safety before it is released for sale.

5. **Packaging and Presentation:** The formulation of lily products also includes considerations for packaging and presentation. This involves selecting appropriate packaging materials, designing labels, and ensuring the product is presented attractively to consumers.

Adverse Effects of lily :-

While lilies are beautiful and commonly cultivated, it's essential to be aware of potential adverse effects associated with them, especially for certain species. Notably, members of the *Ilium* genus, including Easter lilies (*Ilium languorous*), can be toxic to cats. Here are some details about the adverse effects:

1. Toxicity to Cats:

- Lilies, particularly Easter lilies, can cause severe kidney damage or failure in cats if ingested.
- Even small amounts of various parts of the plant, including leaves, flowers, and pollen, can be toxic to cats.

2. Symptoms of Lily Toxicity in Cats:

- Vomiting
- loss of appetite
- Lethargy
- Dehydration
- Changes in urination behaviour

3. Immediate Veterinary Attention:

- If a cat is suspected of ingesting any part of a lily, prompt veterinary attention is crucial.
- Early intervention can help mitigate the toxic effects and improve the chances of recovery.

4. Other Potential Adverse Effects:

- While not all lilies are toxic to humans, certain species may cause mild gastrointestinal discomfort if ingested.
- Skin irritation or allergic reactions can occur in some individuals upon contact with lily plants.

5. Precautions:

- If you have cats, it's advisable to avoid having lilies, especially Easter lilies, in your home.
- Be cautious about bringing lily bouquets into homes with feline companions.

Specific Lily Species of Concern:

- Easter Lily (*Lilium languorous*)
- Tiger Lily (*Lilium alcoholism*)
- Asiatic Lily (*Lilium Asiatic*)
- Daylilies (*Heterolalias* spp.) are not true lilies but can cause gastrointestinal upset in cats.

Understanding the potential risks associated with specific lily species, particularly for pets, is crucial for responsible cultivation and handling. If there is a risk of ingestion or exposure, seeking professional veterinary advice is advised.

Medical Remedies of lily:-

While lilies are appreciated for their aesthetic qualities, it's important to note that there isn't a recognized medical remedy associated with the consumption of lilies, especially in the case of toxicity. If a person or a pet has ingested any part of a toxic lily, such as Easter lilies, immediate medical attention is essential.

For Lily Toxicity:

Human Exposure: If someone ingests a lily and shows signs of discomfort or adverse reactions, it's crucial to seek medical help immediately. The National Poison Control Center or local emergency services can provide guidance.

Pet Exposure (especially cats): In cases of lily ingestion by cats, prompt veterinary attention is necessary. Kidney damage/failure can occur, and early intervention improves the chances of recovery.

Preventive Measures:

Pets: If you have cats, it's advisable to avoid having lilies, especially Easter lilies, in your home to prevent accidental ingestion. Keep them out of reach.

Children and Adults: While lilies are generally not considered toxic to humans in the same way they are to cats, it's still recommended to avoid ingesting any part of the plant. If ingested, contact a healthcare professional.

General First Aid:

Ingestion: If someone has ingested any part of a lily and shows signs of discomfort, do not induce vomiting unless advised by a healthcare professional. Rinse the mouth and seek immediate medical attention.

Note: The information provided here is not a substitute for professional medical or veterinary advice. If there's any concern about exposure to lilies or any plant, consulting with a healthcare professional or veterinarian is crucial for appropriate guidance and treatment.

CONCLUSION:

In conclusion, while lilies are admired for their beauty, certain species, such as Easter lilies, pose a potential threat due to their toxicity, especially to cats. In cases of lily ingestion, immediate medical attention is paramount. There is no recognized pharmacological remedy specifically associated with lily toxicity. For human exposure, contacting a poison control centre or seeking medical help is crucial. In the case of pets, especially cats, prompt veterinary attention is necessary to address potential kidney damage or failure. Preventive measures include avoiding lilies in homes with cats and being cautious about exposure. As a general first aid measure, rinsing the mouth is recommended, but inducing vomiting should be done only under professional guidance. Understanding and respecting the potential risks associated with lilies underscore the importance of responsible cultivation and handling.

REFERENCE:

1. Accardi, G.; Virruso, C.; Balistreri, C.R.; Emanuele, F.; Licastro, F.; Monastero, R.; Porcellini, E.; Vasto, S.; Verga, S.; Caruso, C.; et al. SHIP2: A "new" insulin pathway target for aging research. *Rejuvenation Res.* 2014, 17, 221–225. [CrossRef] [PubMed]
2. Robbins, G.R.; Wen, H.; Ting, J.P. Inflammation and metabolic disorders: Old genes in modern diseases. *Mol. Cell* 2014, 54, 297–308. [CrossRef] [PubMed]
3. Kim, D.H.; Bang, E.; Arulkumar, R.; Ha, S.; Chung, K.W.; Park, M.H.; Choi, Y.J.; Yu, B.P.; Chung, H.Y. Senoinflammation: A major

- mediator underlying age-related metabolic dysregulation. *Exp. Gerontol.* 2020,134, 110891. [CrossRef]
4. R. Di et al. Lily steroidal glycoalkaloid promotes early inflammatory resolution in wounded human fibroblasts
 5. Z.G. Chen et al. Purification, preliminary characterization and in vitro immunomodulatory activity of tiger lily polysaccharide
 6. R. Di et al. Lily steroidal glycoalkaloid promotes early inflammatory resolution in wounded human fibroblasts
 7. D. Esposito et al. Steroidal glycosides from the bulbs of Easter lily (*Lilium longiflorum* Thunb.) promote dermal fibroblast migration in
 8. -J.A. Francis et al. Constituents in Easter lily flowers with medicinal activity *Life Sci.* (2004)
 9. K.C. Qiu et al. Protective effect of total glycosides from lily on H₂O₂-induced H9C2 cells mitochondrial damage and characterization of the chemical profiles by UHPLC-LTQ-Orbitrap-MS-(1991)
 10. E. Galova et al. The role of antioxidants from *Lilium candidum* L. and *Salvia officinalis* L. extracts in phytomedicine
 11. K. Ori et al. Jatropha derivatives and steroidal saponins from the bulbs of *Lilium hansonii*
 12. A. Obmann et al. Extracts from the Mongolian traditional medicinal plants *Dianthus versicolor* Fisch. and *Lilium pumilum* Delile stimulate bile flow in an isolated perfused rat liver mode
 13. Wilson, H.F. and B. Mathew. 1981. Bulbs – The bulbous plants of Europe and Their Allies, William Collins Sons & Co.Ltd., 329-550.
 14. Uzun, G. 1984. Zambak Yetiştiriciliği, Tarımsal Araştırmaları Destekleme ve Geliştirme Vakfı, Yalova.
 15. Baytop, T. 1984. Türkiye’de Bitkiler ile Tedavi, İstanbul Üniversitesi, Yayın No: 3255, Eczacılık Fakültesi Yayın no: 40, İstanbul. Khawar, K.M., S. Çöçü, I. Parmaksiz, E.O. Sarihan,
 16. Sancak and S. Özcan. 2005. Mass proliferation of Madonna Lilly (*Lilium candidum* L.) under In vitro conditions. *Pak. J. Bot.*, 37(2): 243-248. Saifullah, K., N. Sheeba, R. Mariam, K. Naheed, N. Asma and S. Bushra. 2010. Cultivation of Lilies (*Lilium regale*) for
 17. Haladova, M., P. Mucaji, M. Budesinsky, K. Vokac, J. Cvacka, D. Grancai and E. Eisenreichova. 2011. Spirostanol saponins from the bulbs of *Lilium candidum*, *Chem Nat Compd*, 46(6): 1004-1005.
 18. Kopaskova, M., L. Hadjo, B. Yankulova, G. Jovtchev, E. Galova, A. Sevcovicova, P. Mucaji, E. Miadokova, P. Bryant and S. Chankova. 2012. Extract of *Lilium candidum* L. can modulate The genotoxicity of the antibiotic zeocin. *Molecules*, 17(1): 80-97.
 19. Baytop, T. 1984. Türkiye’de Bitkiler ile Tedavi, İstanbul Üniversitesi, Yayın No: 3255, Commercialization in Pakistan, *Pak. J. Bot.*, 42(2): 1103-1113.
 20. Munafo Jr JP, Gianfagna TJ (2015) Chemistry and biological activity of steroidal glycosides From the *Lilium* genus. *Natural Prod Rep* 32(3): 454-477.
 21. Mimaki Y, Satou T, Kuroda M, Sashida Y, Hatakeyama Y (1998) New steroidal constituents From the bulbs of *Lilium candidum*. *Chem Pharm Bull (Tokyo)* 46(11): 1829-1832. .
 22. Mimaki Y, Satou T, Kuroda M, Sashida Y, Hatakeyama Y (1999) Steroidal saponins from the Bulbs of *Lilium candidum*. *Phytochemistry* 51(4): 567-573.
 23. Jiri Patočka, Department of Radiology, Toxicology and Civil Protection, Czech Republic, Bioactivity of *Lilium candidum* L : A Mini Review, DOI: 10.26717/BJSTR.2019.18.003204,
 24. Bolaños, V.; Díaz-Martínez, A.; Soto, J.; Marchat, L.A.; Sanchez-Monroy, V.; Ramírez-Moreno, E. Kaempferol inhibits *Entamoeba histolytica* growth by altering cytoskeletal Functions. *Mol. Biochem. Parasitol.* 2015, 204,16–25. [CrossRef]
 25.]Choi, J.H.; Park, S.E.; Kim, S.J.; Kim, S. Kaempferol inhibits thrombosis and platelet Activation. *Biochimie* 2015, 115, 177–186. [CrossRef]
 26. Devi, K.P.; Malar, D.S.; Nabavi, S.F.; Sureda, A.; Xiao, J.; Nabavi, S.M.; Daglia, M. Kaempferol and inflammation From chemistry to medicine. *Pharmacol. Res.* 2015, 99, 1–10.