CALOTROPIS GIGANTEA'S ANTIARTHRITIC GEL: Formulation and Characterization.

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Abstract: This study aims to formulate and evaluate an antiarthritic gel from Calotropis Gigantia latex. The main objectives include studying the antiarthritic property, developing a cost-effective, robust, stable, and acceptable formulation, and evaluating the gel's consistency and anti-arthritic activity using egg albumin. The herbal gel, which contains antioxidants and less chemicals, can reduce side effects of the skin or mucous membrane. The gel is prepared using a simple method and is safe for skin use. Calotropis gigantea is a potential plant with various healing principles and economic values, used in traditional medicine, ornamental, fuel, fiber, and mosquito control. Future research should focus on standardizing phytochemicals and unknown compounds from this plant, identifying new potent molecules, and developing new drug therapies for better health.

Keywords: Calotropis gigantea, antiarthritic, herbal gel.

INTRODUCTION:

Pharmaceutical drug products in the form in which they are marketed for use are known as dosage forms, also referred to as unit doses. They are made up of a certain mixture of excipients, or active and inactive ingredients, which are dosed into a certain amount and presented in a certain way, such as a capsule shell. At times, the term "dose form" only refers to the way the active ingredient in a drug product is pharmaceutically formulated, including any mixes that may be used; it does not consider other aspects like how the product is ultimately intended to be consumed, such as in the form of a capsule, patch, etc. Because of the somewhat hazy boundaries and ambiguous overlap of these terms, as well as the various variations and qualifiers within the pharmaceutical industry, it is frequently advised to exercise caution when speaking with someone who might not be familiar with another person's use of the phrase. There are multiple types of dosage forms based on the routes of administration. Liquid, solid, and semisolid dosage forms are all included in the dosage form. Tablets, capsules, syrups and pills are among the common dosage forms. In the field of pharmaceutics, a combination of knowledge is used in the creation of dosage forms. This knowledge includes formulations, stability, dissolution, and controlled release (pharmaceutics); absorption, distribution, metabolism, and excretion (pharmacokinetics); concentration-effect relationships and drug-receptor interaction (pharmacodynamics); and treatments of the disease state (pharmacotherapeutics). Medication Dosage Optimization is also critical to reaching clinical efficacy and Safety. Dose optimization is increasingly based on a pharmacokinetic-pharmacodynamic model that describes the drug response. Pharmacokinetics and pharmacodynamics are related by the notion that a drug's receptors and free drug in the systemic circulation are in balance. The process by which a medication interacts with a receptor to produce post receptor-related events that ultimately lead to a pharmacological effect is explained by pharmacodynamics. The route of administration for drug delivery is determined by the dosage form. The same medication may be available in different dosage forms because some medical conditions, like unconsciousness, may restrict the route of administration. For example, it may be challenging to take medication orally when experiencing nausea, especially when vomiting is also present.

In this situation, a different route such as inhalation, buccal, sublingual, nasal, suppository, or parenteral topical medication may be required. Furthermore, certain types of medications may need a particular dosage form due to problems with pharmacokinetics or chemical stability, among other things. A different method may be needed in this case, such as inhalation, buccal, sublingual, nasal, suppository, or parenteral topical medication. Additionally, some medication types may require a specific dosage form because of issues with chemical stability or pharmacokinetics. Topical administration is used for localized skin treatment, internal and external parasite control, and transdermal distribution of medicinal substances. Skin emollients, antifungals, antiseptics, and anti-inflammatory medications are among the medications applied topically for localized effects. The rate of drug release from creams, pastes, and ointments is primarily determined by the semisolid base that is used. Topical medication is an additional option to nourish and protect the skin from harm.
While some topical medications are applied topically, others are meant to work systematically after being absorbed through the skin. Topical formulations consist of a base, or vehicle, that can be customized to fit a particular body area or type of skin. The product's design may aim to deliver moisture or to maximize the penetration of an active ingredient, usually a medication, throughout the skin.

1. Gel: The topical medication formulation contains pastes, ointments, oils, creams, lotions, foams, tinctures, eye-drops, ear-drops, powders, sprays, patches, and gels. Gels are a special type of cream with a water base. Thickeners, like starch, are their primary constituents because they can dissolve active chemicals and bind large amounts of water. Gels can contain a range of active ingredients, are fat-free, and easily applied to the skin. For example, there are gels with anti-itching ingredients or gels that lessen pain. Gels form a film on the skin and cool the area because water evaporates. Gels are semisolid formulations intended for application to the skin or to accessible mucosal membranes, like the oral cavity. Gels consist of two interpenetrating systems in which the colloidal particles, called gallant or gelator, are uniformly distributed in a solvent or dispersion media to form a three-dimensional matrix called the gels. A gelling agent (gelator), which can be a low molecular weight small molecule or a natural, synthetic, or semi-synthetic polymer, is added to an organic, inorganic, or aqueous solvent or solvent systems to form the gels (fig. 1). In gels, the polymer serves as the gel matrix's structural support. The structural strength, enhanced adhesion to the surface, and lower permeability of bigger molecules are all attributed to the polymeric meshwork of gel, which also enables retention.

![Fig. 01. Swelling of gelling agent in solvent.](image)

Gels can be irreversible or reversible depending on the kind of bonding used. Reversible gels typically have hydrogen bonds, while irreversible gels typically have covalent bonds. A gel can exhibit two distinct phases: A single phase with no obvious boundaries or a two phases system with discrete particle floccules. **Properties of gels:** there are various types of properties of gel, some of them are as follows.

- The gelling agent should ideally be safe, inert, and unable to react with other ingredients in the formulation.
- They demonstrate the solid state's mechanism features.
- The aqueous medium and dispersion phase are highly attracted to one another, preventing the gels from freely settling and remaining uniform when standing.
- The gelling agent should, while stored, provide a perceptible solid-like character that breaks quickly when subjected to shear forces generated by squeezing the tube, shaking the bottle, or applying topically.
- The topical gel must not be sticky.
- Every element remains constant throughout the system.
- As the effective crosslink density of the gel grows, so does the apparent viscosity or gel strength. However, a rise in temperature may cause the apparent viscosity to change, based on the molecular contacts between the solvent and polymer, and the apparent viscosity to change, based on their interactions.
- An appropriate antimicrobial agent should be present.
- The eye gel needs to be sterile.

**Formulation of Gels:** A gel is produced by striking a balance between the solvent and the polymer. The gel is created at a critical concentration; viscosity increases dramatically above this point, but gel cannot form below it. This point is also known as the gelling point. The polymer's hydrophilic and lipophilic balance, the solvent-polymer interaction, the homogeneity of the structure, the molecular weight of the polymer, and the flexibility of the polymer chain can all be used to determine the gelling point. The gelling point and flexibility are directly proportional to each other. The gelling point of that polymer can be raised or lowered by solvents with varying affinities for it. You have to change the temperature in order for some gels to form. Their basic manufacturing procedure is to heat the liquid, add the polymer, mix well, and then let it cool so that the polymer settles. In contrast to this method, some gels—like hydrogen bonds—should not be heated because doing so will cause the bonds to break. Another way to formulate gels is through flocculation. This can be achieved by combining salts with the lipophilic solutions to create the gel. An example of this
type of interaction is when fumed silica and mineral oil are used to form a gel by hydrogen bonding between the individual particles.

An additional example would be the forceful mixing of benzene and ethyl cellulose to create a homogenous gel. It was also observed that the development of the gel is caused by rheological changes brought on by the presence of electrolyte. These include the Na⁺–montmorillonite clay of the smectite group (bentonite) and the hydroxides of iron and magnesium. Gels can also be created by chemical reactions, such as treating titanium with H₂O₂ and 0.1 milligram hydrogen chloride. This reaction causes the surface of titanium to gel, and as the surface concentration of H₂O₂ and 0.1 m HCl solution increases, so does the thickness of the gel layer.

**Advantages of Gel Formulations:** Some of the primary advantages or benefits that gel formulations have over other semisolid dosage forms are as follows:

- Gels can prevent gastrointestinal pH-related problems with medicine absorption in the gastrointestinal tract.
- They are used as the best possible cutaneous and percutaneous medication administration.
- They are easier to formulate than other semisolid dose forms.
- They have good spreadibility and cooling effects because of solvent evaporation.
- The retention period of gels is longer than that of other topical dose forms.
- A gel is an advanced, non-greasy concoction.
- They are both biocompatible and biodegradable.
- They can be washable and naturally harmless.
- They have much less serious long-term stability issues.
- They can be used to give both non-polar and polar medications.
- When it is not appropriate to give oral medicines, they may serve as a substitute.

**Disadvantages / Limitations of Gel Formulations:**

Gel formulations have some benefits, but they can have certain drawbacks or restrictions, Like:

- Certain gels include covalent connections that make them indestructible, enclosing the medication within the gel matrix.
- Evaporation of the formulation's solvent might cause the gel to dry.
- Rheology of certain gels may change as a result of changes in humidity, temperature, and other environmental conditions.
- The inclusion of polymers in gel formulation may cause certain medications to deteriorate.
- Irritation may be caused by the gelators or the additives.

**Gel Uses:** There are various uses of gel. Some uses are as follows:

- phosphate gel and sodium fluoride gel are used for preventative tooth care.
- lubricant for catheter.
- base for patch test.
- for electrocardiogram, nacl gel is used.
- the binders are used in granulation of tablets, in suspensions for protective colloids, and in oral liquid used as thickeners.
- also used in the cosmetic products such as perfumes, dentifrices, shampoos, and the preparations for skin and hair care products.
- a long-acting medication that is implanted in the body or injected into a muscle.
- gel formulations that are external and meant to be applied directly to the skin, mucous membranes, or eyes
- gel can be used as an oral drug delivery system.
2. Calotropis gigantea:

Herbal treatments are increasingly popular worldwide, used alone or in combination with prescription medications to treat and manage illnesses. Plants have been a vital source for creating medicines to promote and maintain health, prevent disease, and treat illnesses. The World Health Organization promotes the practice of traditional medicine as long as it is safe and effective. The majority of people worldwide rely on traditional medicines, which use extracts from medicinal plants. Calotropis gigantea, a common herb from Asian countries, is known for its healing abilities and is commonly used in traditional ayurvedic medical systems. The plant is abundant in natural food and can be easily and inexpensively grown. The herb's stem yields a milky latex, and its oval-shaped, light green leaves produce a milky latex. The use of herbal remedies has evolved from relying on the expertise and talent of practitioners to focusing on safety and effectiveness.

Characteristics of Calotropis gigantea:

Geographical Distribution: It is commonly available practically everywhere in the world. Originally from India, China, and Malaysia, it is primarily found in south India, lower Bengal, the Himalayas, Punjab, Assam, and Madras. Frequent in waste areas, railroad embankments, and roadside elevations of up to 1000 meters in the Himalayas, spanning from Punjab to Assam.

Morphology of Plant:

Macroscopic Characteristics: Calotropis gigantea is a popular plant for herbal medicine, growing in hard, arid soils with moderate rainfall. Its woody roots are circular, cylindrical, and branching, covered in fissured, corky bark with a yellowish tint. The plant has waxy, pale blooms with five pointed petals, and its flowers are actinomorphic, bisexual, bracteate, and pentamerosus. The plant has oval, light yellowish green leaves and a milky stem, with five stamens, a pistil, and a consistent anther. Calotropis gigantea produces simple, floppy, inflated, sub-globose fruit, and its tiny, flat, obovate seeds have a white, silky pappus hair. The plant has a broad potential for natural regeneration.

Microscopic characteristics: In the root system, cork is the uppermost layer that is circular and has a compact arrangement of 15-20 rectangular cells with no intracellular gap in the transverse section. Cortex segment cells contain a large amount of starch granules. Asymmetrical and irregularly shaped parenchymatic cells with laticiferous tubes and a calcium oxalate badge. The transverse section of leaves exhibits crossing epidermal cells coated in a thick, striated, hard outer covering cuticle on both sides of the leaf. Mostly made up of trachieds and veins in xylem. A wide range of insects and butterflies are attracted to this plant.

Active Constituents of Calotropis Gigantea: There are lots of Chemical constituents present in the plant of Calotropis Gigantea, every part of the plant contains different Active constituents.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Plant Part</th>
<th>Active Constituents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Root</td>
<td>Calotropnaphthlene, Calotropinesespenol</td>
</tr>
<tr>
<td>2</td>
<td>Root Bark</td>
<td>B-Amyrin, Two Isomeric Crystalline Alcohols, Giganteol, Isogiganteol, And Cardenolides.</td>
</tr>
<tr>
<td>3</td>
<td>Stembark</td>
<td>B-Calotropeol, Bamyrin, Giganteol.</td>
</tr>
<tr>
<td>4</td>
<td>Leaves</td>
<td>Alkaloids, Glycosides, Mudarine</td>
</tr>
<tr>
<td>5</td>
<td>Latex</td>
<td>Proteinase, Cysteine, 3’-Methyl Butanoates Of Alpha Amyrin And Sigma Taraxasterol, Triterpine Ester, Akundarin, Latex Contains, Uscharin, Calotoxin, Calactin, Latex Also Contains Acalatropeol, B- Calotropeol, B-Amyrin And Calcium Oxalate</td>
</tr>
<tr>
<td>6</td>
<td>Flower</td>
<td>Bitter Resins Akundarin, Na-Calatropeol, B-Calotropeol, Amyrin, Cardioactive Glycosides, Mudarine, Asclepin, Calotropin</td>
</tr>
</tbody>
</table>

Activities Shown by Calotropis Gigantea:

Anti-inflammatory activity:
The anti-inflammatory properties of calotropis gigantea were evaluated using various animal models, including chloroform, n-butanol, ethanol, and distilled water extracts. The carrageenan-induced rat paw oedema method was used to compare the activity with paracetamol. The anti-inflammatory effect was found to outperform the albumin denaturation procedure for acute and chronic inflammation.
Anti-arthritic activity:
One percent of adults worldwide suffer from rheumatoid arthritis, a chronic inflammatory autoimmune disease marked by increased joint pain, stiffness, swelling, and loss of joint function. There was an increase in pro-inflammatory cytokines such as tnf-α, il-6, il-10, and il-1β. Calotropis gigantea contains lupeol, which is said to have anti-inflammatory and anti-arthritic qualities.

Antidiabetic activity: Plant extracts from Calotropis gigantea have hypoglycemic properties; when diabetes is present, Calotropis gigantea prevents the body from losing weight; in the pancreatic islet, Calotropis gigantea increases the number of granulated cells and normal beta cells; it has been claimed that the plant extract works wonders in lowering experimental animals' high serum glucose levels. Multiple studies have shown that Calotropis gigantea exhibits antidiabetic efficacy by lowering increased blood glucose levels.

Vasodilation activity: The rana hexadaetyla (green frog) was used to study the vasodilation activity of the latex extract of Calotropis gigantea. The cardiac output increased by a percentage when the diluted crude extract at 1:10 and 1:100 concentrations was mixed with purified water. While 1:10 results in 50% cardiac output, a higher dilution factor increases cardiac output by 66%. This indicates that at a certain dose content, the latex has a vasodilatory action.

Analgesic activity: The alcoholic extraction of calotropis gigantea flowers was reported for the analgesic activity on various preclinical studies. Oral dose of alcoholic extract produced a significant decrease in the incidences of writhings reflexes and paw licking time. The activity is studied by using acetic acid writhing model and hot plate method.

Arthritis: Arthritis is the term for intra-articular inflammation, which can result from a multitude of etiologic factors. The broad category of diseases collectively known as arthritis is primarily caused by pathologies affecting the articular cartilage, synovium, and supporting subcomponent structures. Degenerative joint disease is a devastating condition that results from most diseases, regardless of the underlying cause, if treatment is not received. The symptoms of end-stage arthritis are often associated with severe pain and decreased function. Reduced range of motion, potential deformity and instability, and joint pain in the afflicted joint are common symptoms of arthritis. Often, nonoperative treatment is the mainstay, with a focus on anti-inflammatory medication treatment, activity modification, and patient education.

Types of Arthritis: There are more than 100 different types of arthritis. some of the most common types includes:

Rheumatoid Arthritis: Rheumatoid Arthritis (RA) is a chronic inflammation that causes joint pain and stiffness, often affecting both hands and knees. It affects around 1.5 million adults in the United States and is more common in women than men. Juvenile Arthritis, another inflammation, is often associated with RA in children and teenagers. Modern drugs can prevent joint degeneration, making severe joint deformities less common. Early diagnosis and appropriate therapy can help avoid joint damage and other consequences. Orthopedic operations can significantly improve function, mobility, and overall quality of life in severely affected joints. Although there is no cure for RA, early diagnosis and appropriate therapy can help prevent severe joint damage and improve overall quality of life.

Osteoarthritis: Osteoarthritis, also known as Oa or Degenerative Joint Disease, is the most common type of arthritis. It occurs when affected joints become so worn out that bones rub against each other due to the deterioration of the cartilage lining them. Cartilage, a layer of hard, smooth cartilage, serves as a lubricant and shock absorber, causing the bones to rub against each other. Osteoarthritis typically begins in the hands, knees, hips, neck, and lower back.

Ankylosing Spondylitis: Axial spondyloarthitis, also known as Ankylosing Spondylitis, is an inflammation-related condition that can lead to the fusion of vertebrae, causing a slumped posture and reduced spinal flexibility. The body tries to heal by forming new bone, which eventually joins vertebrae segments and flattens the natural curve of the spine. The condition has two types: X-ray-found Ankylosing Spondylitis and Nonradiographic Axial Spondyloarthritis. Symptoms usually start in early adulthood, and other bodily parts can also become inflamed. There is no known cure, but certain medications may help manage symptoms and potentially slow the disease’s progression.

Methodology

Preparation of Gel: The process involved dissolving Carbopol 940 in distilled water, dissolving Disodium Edta in Triethanolamine, and preparing Propylene Glycol. Then, the Carbopol solution was adjusted to 7.4 and stirred for 10 minutes. Propylene Glycol was added, stirring for 10 minutes until a clear, consistent gel base was obtained. Finally, Calotropis Gigantea latex was added to the gel base with sufficient water.
Table No. 3 Chemicals used for formulation

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Ingredients</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Calotropis Gigantea (Latex)</td>
<td>2 Ml</td>
<td>2 ml</td>
<td>3 ml</td>
<td>3 ml</td>
</tr>
<tr>
<td>2)</td>
<td>Carbopol 940</td>
<td>1 Gm</td>
<td>0.5 Gm</td>
<td>1 Gm</td>
<td>0.5 Gm</td>
</tr>
<tr>
<td>3)</td>
<td>Di Sodium Edta</td>
<td>5 Mg</td>
<td>5 Mg</td>
<td>5 Mg</td>
<td>5 Mg</td>
</tr>
<tr>
<td>4)</td>
<td>Triethanolamine</td>
<td>2 Ml</td>
<td>2 Ml</td>
<td>2 Ml</td>
<td>2 Ml</td>
</tr>
<tr>
<td>5)</td>
<td>Propylene Glycol</td>
<td>5 Ml</td>
<td>5 Ml</td>
<td>5 Ml</td>
<td>5 Ml</td>
</tr>
<tr>
<td>6)</td>
<td>Water</td>
<td>Upto 100 Ml</td>
<td>Upto 100 Ml</td>
<td>Upto 100 Ml</td>
<td>Upto 100 Ml</td>
</tr>
</tbody>
</table>

Evaluation of Gel

**Organoleptic Properties:** Organoleptic properties are those aspects of formulation that an individual-experiences via senses including taste, sight, smell and touch.

a) **Colour** - The colour of all the formulation can be observed visually.

b) **Odour** - The odour can be evaluated through smell.

c) **Appearance and homogeneity test** - Physical appearance and homogeneity of the prepared gels were evaluated by visual perception.

d) **Ph Test** - The gel's pH was measured using a digital pH meter, with the average readings recorded in triplicate.

e) **The Spreadbility test** - A spreadbility test was conducted using two sets of standard-dimension glass slides, with the herbal gel formula placed over one slide and the other on top. A hundred grams of gel was placed on the upper slides, forming a thin layer. The gel was then removed and excess was scraped off. The slides were fixed to a stand, and a 20-gram weight was carefully tied to the upper slide. The time taken for the upper slide to travel 7.5 cm and separate from the lower slide was noted. The experiment was repeated three times, and the mean time was calculated. The spreadbility was calculated using the formula $S = \frac{M \times L}{T}$.

Where, $S=$ Spreadbility, $M=$ Weight Tied to Upper Slides (20 G), $L=$ Length of The Glass Slide (7.5 cm), $T=$ Time Taken in Sec.

f) **Skin Irritation Test of Gel** - Mark an area on left hand dorsal surface. the cream is applied to the specified area and time is noted. Allergic or toxic reaction is observed in regular intervals after 24 hours and noted.

g) **Viscosity** - Viscosity of gel was determined using brookfield viscometer (s-64, model lvdv-e) at 25 o c with a spindle speed of the viscometer rotated at 1,1.5,2,2.5,3,4 rpm.

Evaluation of Anti-Arthritic Activity of Gel

**Inhibition of Protein Denaturation Method Using Egg Albumin:**

In vitro anti-arthritic activity of calotropis gigantea was analyzed against protein denaturation method using fresh hen’s egg albumin. The reaction mixture (5 ml) consisting of 0.2 ml of egg albumin (from fresh hen’s egg), 2.8 ml of phosphate buffered saline (ph 6.4) and 2 ml of different concentrations (25, 100, and 400 µg/ml) of diclofenac sodium and formulation f1, f2, f3, f4 and pure latex were prepared. while pbs served as a control. The mixtures were incubated at 37 ± 2°C in incubator for 15 min and then heated at 70°C for 5 min. After cooling their absorbance were measured at 660 nm by using vehicle as a blank. The percentage inhibition of protein denaturation was calculated by using the following formula.

$$\text{Percentage Inhibition} = 100 \times \left[ \frac{\text{Absorbance of Test Sample}}{\text{Absorbance of Control}} - 1 \right]$$
RESULT AND DISCUSSION

Table No.4: Evaluation of Formulation:

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Evaluation Parameter</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Colour</td>
<td>Creamish White</td>
<td>Creamish White</td>
<td>Creamish White</td>
<td>Creamish White</td>
</tr>
<tr>
<td>2.</td>
<td>Odour</td>
<td>+Ve Good</td>
<td>+Ve Good</td>
<td>+Ve Good</td>
<td>+Ve Good</td>
</tr>
<tr>
<td>3.</td>
<td>pH</td>
<td>7.8</td>
<td>7.44</td>
<td>7.20</td>
<td>7.47</td>
</tr>
<tr>
<td>4.</td>
<td>Spreadability</td>
<td>55 Sec</td>
<td>10 Sec</td>
<td>50 Sec</td>
<td>11 Sec</td>
</tr>
<tr>
<td>5.</td>
<td>Skin Irritation</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6.</td>
<td>Appearance and Homogeneity</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

Physicochemical Parameters:

a) Colour- All the formulation shown creamish white colour.

b) Odour- All the formulation was odourless.

c) Appearance and homogeneity - All of the formulation were homogenous. Any kind of separation or lumps formation were not shown.

pH: The pH of all the formulation ranges in between 7.2 To 7.8.

Spreadability: All of the formulation shown good spreadability.

Skin irritation: Observing the marked area where the formulation was applied. There were no signs of allergic or toxic reaction.

Viscosity: The viscosity of all the formulation ranges from 162600 cps to 360400 cps. the F2 formulation shows the lowest viscosity and the F3 formulation shows highest viscosity.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Rpm</th>
<th>F1 % Torque</th>
<th>Viscosity (Cps)</th>
<th>F2 %</th>
<th>F3 %</th>
<th>F4 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0</td>
<td>30.9</td>
<td>183400</td>
<td>27.1</td>
<td>37.7</td>
<td>20.9</td>
</tr>
<tr>
<td>2</td>
<td>1.5</td>
<td>96.4</td>
<td>385600</td>
<td>6.9</td>
<td>27600</td>
<td>16.3</td>
</tr>
<tr>
<td>3</td>
<td>2.0</td>
<td>95.5</td>
<td>298200</td>
<td>3.0</td>
<td>9000</td>
<td>8.2</td>
</tr>
<tr>
<td>4</td>
<td>2.5</td>
<td>96.3</td>
<td>315400</td>
<td>8.3</td>
<td>19920</td>
<td>44.3</td>
</tr>
<tr>
<td>5</td>
<td>3.0</td>
<td>95.2</td>
<td>284500</td>
<td>8.5</td>
<td>17000</td>
<td>82.2</td>
</tr>
<tr>
<td>6</td>
<td>4.0</td>
<td>96.5</td>
<td>322300</td>
<td>11.3</td>
<td>16950</td>
<td>48.3</td>
</tr>
</tbody>
</table>

Anti-Arthritic Activity:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sample Name</th>
<th>Absorbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pure Latex</td>
<td>0.1991</td>
</tr>
<tr>
<td>2.</td>
<td>F1</td>
<td>0.1870</td>
</tr>
<tr>
<td>3.</td>
<td>F2</td>
<td>0.0104</td>
</tr>
<tr>
<td>4.</td>
<td>F3</td>
<td>0.1347</td>
</tr>
<tr>
<td>5.</td>
<td>F4</td>
<td>0.1695</td>
</tr>
<tr>
<td>6.</td>
<td>Diclofenac</td>
<td>0.0013 (25 Ug/Ml)</td>
</tr>
<tr>
<td>7.</td>
<td>Dmso (-Ve)</td>
<td>0.0030</td>
</tr>
</tbody>
</table>

CONCLUSION:

The herbal gel reduced various types of side effects of the largest organ of the body [skin] because it contains natural values and less chemicals alternatively, mucous membrane gel is made using a basic technique. The antioxidant-
containing herbal gel that can be used to prevent the formation of a barrier to protect skin. Additionally, using the formulations on skin is safe.

FUTURE SCOPE:

Potential medicinal and commercial plant Calotropis gigantea has many uses. It is widely distributed throughout India and is used for a variety of purposes, including traditional medicine, ornamentation, fuel, fiber, auxiliary plants, and mosquito control. The plant's various parts, including the root, leaves, root bark, milk, and flower, are also used in traditional medicine to treat a range of human ailments. Even though Calotropis gigantea has a number of medicinal uses, more research is still needed to standardize the phytochemicals and an unidentified compound found in this plant, identify a new, powerful molecule that suppresses a variety of pathological disorders, and create a new class of drug therapies that will improve human health.

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