

Preparation and Evaluation of Dikamali Gel

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ABSTRACT:- Natural gums became a thrust area in majority of investigations in the novel drug delivery systems. The use of natural polymers (gums) for pharmaceutical applications is attractive because they are economical, readily available, non-toxic and capable of chemical modifications, potentially biodegradable and also biocompatible.

The gum Dikamali is an important resin drug in the Indian System of Medicine. The market sample of Madras Crude drug trade has been identified as the gums of *Gardenia gummifera* Linn. f. of Rubiaceae. The morphology, microscopical structure of the source material, the fluorescence analysis and the chemical studies including thin layer chromatography of the drug are reported. In the present study dikamali resin (obtained from the leaf bud and young shoot of the *GARDENIA GAMMIFERA* LINN.) was extracted with diethyl ether by maceration technique of extraction. The extract was screened for analgesic, anti-inflammatory, antipyretic and anthelmintic (100 200 400mg/kg) activities by standard method. The extract exhibited significant graded dose response for analgesic, anti-inflammatory, antipyretic and anthelmintic activity. The present study proved the claim of dikamali resin mentioned in the Indian system of medicine and it is effective against the pulpitis (tooth coming process in the children of age 6 month to 2 years)

Magnifera alkaloid, flavanoid, phenolic content, saponin (obtained from the leaves of *MAGNIFERA INDIACA* LINN.) was extracted with aqueous medium. The extract from mango leaves have been studied for their biological activities i.e. anti-cancer, anti-obesity, anti-diarrheal. Considering the phytochemical profile of mango leaves they can be used as a potential ingredient for the development of functional food and

pharmaceutical drugs

By studying both the drugs (*Gardenia gummifera* and *Magnifera indica*) leaves the dikamali gel gives the effect of anti-inflammatory activity with anti-diarrheal effect.

I. INTRODUCTION

HERBAL medicine is still the mainstay of about 75–80% of the world population, mainly in the developing countries, for primary health care because of better cultural acceptability, better compatibility with the human body and lesser side effects.

However, the last few years have seen a major increase in their use in the developed world. In Germany and France, many herbs and herbal extracts are used as prescription drugs and their

sales in the countries of European Union were around \$6 billion in 1991 and may be over \$ 20 billion now. In USA, herbal drugs are currently sold in health food stores with a turnover of about \$ 4 billion in 1996 which is anticipated to double by the turn of the century. In India, the herbal drug market is about \$ one billion and the export of plant-based crude drugs is around

\$80 million. Herbal medicines also find market as nutraceuticals (health foods) whose current market is estimated at about \$ 80–250 billion in USA and also in Europe.

India is sitting on a gold mine of well-recorded and well-practiced knowledge of traditional herbal medicine. But, unlike China, India has not been able to capitalize on this herbal wealth by promoting its use in the developed world despite their renewed interest in herbal medicines. This can be achieved by judicious product identification based on diseases found in the developed world for which no medicine or only palliative therapy is available;

such herbal medicines will find speedy access into those countries. Backward integration from market demands will pay rich dividends. Strategically, India should enter through those plant-based medicines which are already well accepted in Europe, USA and Japan. Simultaneously, it should identify those herbs (medicinal plants) which are time-tested and dispensed all over in India.

The basic requirements for gaining entry into developed countries include:

- (i) well-documented traditional use
- (ii) single plant medicines
- (iii)

medicinal plants free from pesticides, heavy metals, etc.

(iv)

standardization based on chemical and activity profile

- (v) safety and stability.

However, mode of action studies in animals and efficacy in human will also be supportive.

Such scientifically generated data will project the herbal medicine in a proper perspective and help in sustained global market.

➤ HERBAL MEDICINE

The World Health Organization (WHO) has recently defined traditional medicine (including herbal drugs) as comprising therapeutic practices that have been in existence, often for hundreds of years, before the development and spread of modern medicine and are still in use today or say, traditional medicine is the synthesis of the therapeutic experience of generations of practicing physicians of indigenous systems of medicine. The traditional preparations comprise medicinal plants, minerals, organic matter, etc. Herbal drugs constitute only those traditional medicines which primarily use medicinal plant preparations for therapy.

The earliest recorded evidence of their use in Indian, Chinese, Egyptian, Greek, Roman and Syrian texts dates back to about 5000 years. The classical Indian texts include Rigveda, Atharvaveda, Charak Samhita and Sushruta Samhita. The herbal medicines/traditional medicaments have, therefore, been derived from rich traditions of ancient civilizations and scientific heritage.

➤ HERBAL MEDICINE MARKET

As per available records,

the herbal medicine market in 1991 in the countries of the European Union was about \$ 6 billion (may be over \$ 20 billion now), with Germany accounting for \$3 billion, France \$ 1.6 billion and Italy \$ 0.6 billion³. Incidentally in Germany and France, herbal extracts are sold as prescription drugs and are covered by national health insurance. In 1996, the US herbal medicine market was about \$ 4 billion and with the current growth rate may be more than double by the turn of century. Thus a reasonable guesstimate for current herbal medicine market worldwide may be around \$ 30–60 billion. The Indian herbal drug market is about \$ one billion and the export of herbal crude extracts is about \$80 million (Table 1). The 10 best-selling herbal medicines in developed countries are given in Table 2. The sales of these drugs account for almost 50% of the herbal medicine market. These drugs have been well standardized and some of them namely echinacea, garlic, ginkgo, ginseng and saw palmetto are supported with mode of action and clinical studies. Amongst the developed countries Germany holds the lead and has published individual monographs on the therapeutic benefits of more than 300 herbs. In developing countries, China has compiled/generated data on over 800 medicinal plants and exports large amounts of herbal drugs. India has prepared only a few monographs and its exports are dismal.

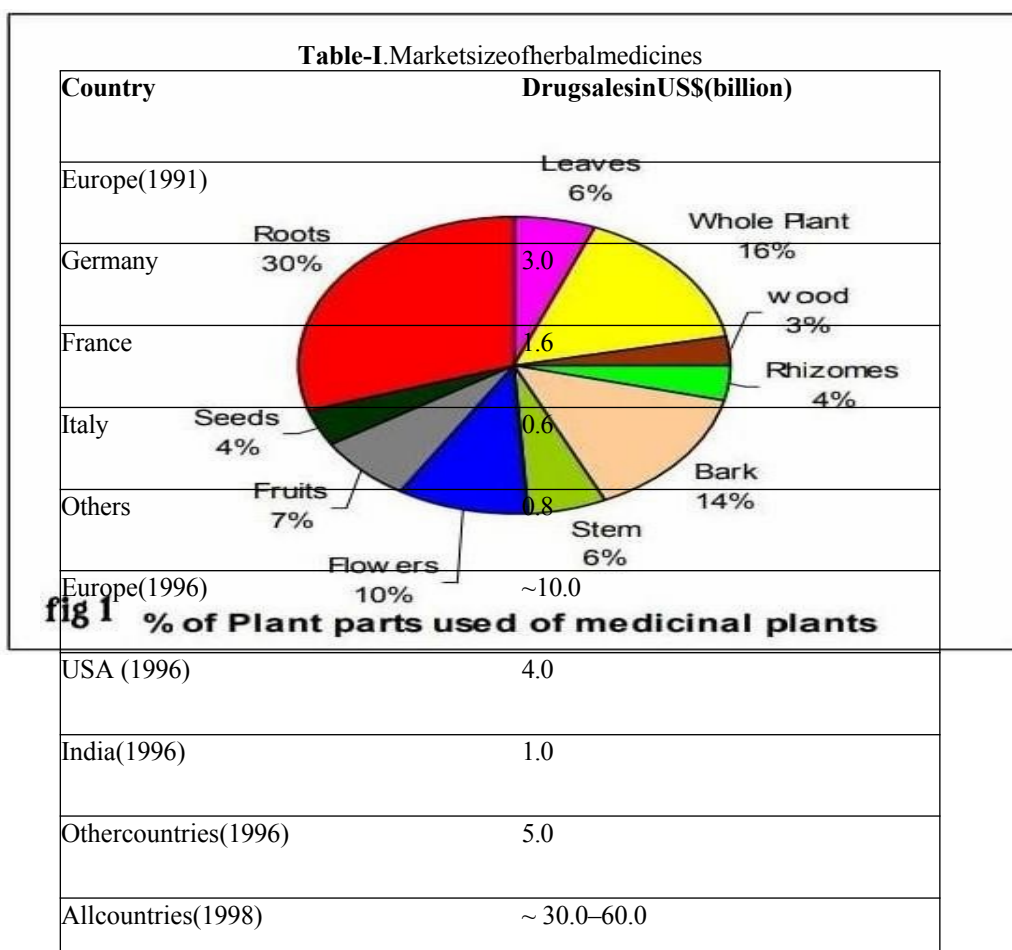
➤ WHY HERBAL MEDICINE?

Herbal medicines are being used by about 80% of the world population primarily in the developing countries for primary health care. They have stood the test of time for their safety, efficacy, cultural acceptability and lesser side effects. The chemical constituents present in them are a part of the physiological functions of living flora and hence they are believed to have better compatibility with the human body. Ancient literature also mentions herbal medicines for age-related diseases namely memory loss, osteoporosis, diabetic wounds, immune and liver disorders, etc. for which no modern medicine or only palliative therapy is available. These drugs are made from renewable resources of raw materials by ecofriendly processes and will bring economic prosperity to the masses growing these raw materials.

The turnover of herbal medicines in India as over-the-counter products, ethical and classical formulations and home remedies of Ayurveda, Unani and Siddha systems of medicine is about

\$1 billion with a meagre export of about \$80 million. Psyllium seeds and husk, castor oil and opium extract alone account for 60% of the exports. 80%

of the export to developed countries are of crude drugs and not finished formulations leading to low revenue for the country. Thus the export of herbal medicines from India is negligible despite the fact that the country has a rich traditional knowledge and heritage of herbal medicine. Considering the huge herbal medicine and nutraceutical market in developed countries, India should reconsider exporting crude herbal drugs.



Three of the 10 most widely selling herbal medicines in developed countries, namely preparation of *Allium sativum*, *Aloe barbadensis* and *Panax* species are available in India (Table 2). India is the largest grower of *Psyllium* (*Plantago ovata*) and *Senna* (*Cassia senna*) plants and one of the largest growers of *Castor* (*Ricinus communis*) plant. These are also exported in large amounts and yet our market share is dismal because of export of crude extracts/drugs. Twenty other plants are commonly exported as crude drugs worth \$ 8 million. Five of these, namely *Glycyrrhiza glabra*, *Commiphora mukul*, *Plantago ovata*, *Aloe barbadensis* and *Azadirachta indica* are even used in modern medicine. India is one of the 12 mega biodiversity centres having over 45,000 plant species. Its diversity is unmatched due to the presence of 16 different agroclimatic zones, 10 vegetative zone and 15 biotic provinces. The country has 15,000–18,000 flowering plants, 23,000 fungi, 2500 algae, 1600 lichens, 1800 bryophytes and 30 million micro-organisms. India also has equivalent to 3/4 of its land exclusive economic zone in the harbouring a large variety of flora and fauna, many of them with therapeutic properties. About 1500 plants with medicinal uses are mentioned in ancient texts and around 800 plants have been used in traditional medicines.

Table II. Ten best-selling herbal medicines in USA

Common name	Market rank as per sale
1. Echinacea species	219
2. Garlic <i>Allium sativum</i>	141
3. Goldenseal <i>Hydrastis canadensis</i>	135
4. Ginseng <i>Panax</i> species	110
5. Ginkgo <i>Ginkgo biloba</i>	109
6. Saw palmeto <i>Serenoa repens</i>	102
7. Aloe gel <i>Aloe barbadensis</i>	88
8. Ephedra species	65
9. Eleutherococcus <i>senticosus</i>	69
10. Cranberry <i>Vaccinium macrocarpon</i>	52





traditional health systems (including herbal medicine) as 'holistic' – 'that of viewing man in his totality within a wide ecological spectrum, and of emphasizing the view that ill health or disease is brought about by an imbalance or disequilibrium of man in his total ecological system and not only by the causative agent and pathogenic evolution' (WHO6), probably implying that the indigenous system drugs (including herbal medicine) restore the imbalance or disequilibrium leading to the cure of ill health or disease. Such an attitude sent signals that WHO as an organization has failed to provide leadership to establish traditional systems of medicine which provide health care to about 80% of the world population. However, it helped the inclusion of proven traditional remedies in national drug policies and regulatory approvals by developing countries. The World Health Assembly continued the debate and adopted a resolution (WHA 42.43) in 1989 that herbal medicine is of great importance to the health of individuals and communities. The redefined definition of traditional medicine thus issued in the early nineties is given *vide supra* (see herbal medicine). Consequently, in 1991 WHO developed guidelines for the assessment of herbal medicine⁷, and these were ratified by the 6th International Conference of Drug Regulatory Authorities held at Ottawa in the same year. The salient features of WHO guidelines are: (i) Quality assessment: Crude plant material; Plant preparation; Finished product. (ii) Stability: Shelf life. (iii) Safety assessment: Documentation of safety based on experience or/and; Toxicology studies. (iv) Assessment of efficacy: Documented evidence of traditional use or/and; Activity determination (animals, human).

➤ **AIM OF WORK:-**
PREPARATION AND EVALUATION OF DIKAMALIGEL.

➤ **OBJECTIVE OF WORK :**
Dikamaligel is commonly used in traditional and Ayurvedic medicine for its various medicinal properties. The objective of using Dikamali gel typically includes:-

- Anti-inflammatory Effects: It helps reduce inflammation in conditions like arthritis, muscle aches, or joint pains.
-

Antimicrobial Properties: Dikamaligel has been traditionally used to prevent and treat bacterial or fungal infections on the skin.

•
Wound Healing: It may promote faster healing of wounds, minor cuts, and abrasions due to its natural healing properties.

•
Pain Relief: It is applied topically to relieve pain, especially in conditions like joint or muscle pain.

•
Skin Health: The gel can help in improving skin texture, reducing itching, and providing relief from minor skin irritations.

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The core objective of Dikamaligel's work is to harness its natural properties to provide relief from pain, inflammation, and infections while promoting overall skin and tissue health.

II. LITERATURE REVIEW:-

1. SUMAD., RAJIR.N. AND LATHAM.S.(2021)

They all studied on the 'review of the Gardenia Gummifera and its bioactive compound and ethnomedicinal properties' this review is an innovative approach to find the current status of a renowned medicinal plant which is found in the tropical forest of India. They give all the information about the herbal plant and gave full taxonomic classification of the plant dikamali. They account the phytoconstituent and extraction process of the chemical constituent of the dikamali plant. Also report the pharmacological activities of the drug. They also study the recent research on Gardenia Gummifera such as cardioprotective effect, hepatotoxicity and antioxidant activity, antibacterial activity.

2. ANAND KUMARA., MURALIDHARAN R., BALASUBRAMANIAN (1984):-

All studied on the 'review of the Gardenia Gummifera'. The market sample of Madras crude drug trade has been identified as the gums of Gardenia gummifera Linn. Of RUBIACEAE. They account the pharmacological activity, material and method. They also give evidence of the fluorescence analysis, chemical studies,

chromatographic studies. All the microscopical studies are also done .

3.

SIVASANKARMOHANTY, KRISHNAMOHANG.(2013):-

They all study on the activities of the Dikamali extract which gives various pharmacological activities of the drug such as analgesic, antipyretic, anti-inflammatory, antihemorrhagic activity of drug. Also mention the various extraction material and method.

4. GMMASUDPARVEZ(2007):-

He studied on the topic of pharmacological activities of mango leaves. Mango belongs to the genus *Mangifera* which consists of about 30 species of tropical fruiting trees in flowering plant. He studied various pharmacological activity of mango leaves such as anticancer, antidiabetic, anti-inflammatory, hepatoprotective, analgesic-antipyretic, anti-ulcer, anti-diarrheal, antifungal, antimalarial activity, etc.

5.M.T.YAKUBA,S.S.SALIMON(2015):-

They provide all the required information of the mango leaves such as extraction procedure, material and method, their chemical studies and provide the evidence of animal study. Albino rats are used to study the antidiarrheal activity of that drug .

➤ **PLAN OF WORK**

1. Literature Review:

- Conduct a in-depth review of existing literature on herbal plant, focus on the properties and benefits of dikamali extract in pediatric formulations.

Identify relevant studies, research articles, and scientific publications to inform the formulation and evaluation of the herbal dikamali formulation.

2. Selection of Drug:

- Choose dikamali as the primary herbal ingredient for the gel formulation based on its documented therapeutic properties and compatibility with dikamali powder.
- Consider the phytochemical composition and bioactive compounds present in dikamali that contribute to its potential skincare benefits.

3. Procurement Study of The Drug:

- Conduct a procurement study to source high-quality dikamali extract or raw dikamali stems from reliable suppliers or vendors.
- Ensure compliance with regulatory standards and quality control measures during the procurement process to guarantee the purity and authenticity of the dikamali ingredient.

4. Preparation of dikamali multipurpose gel:-

- Develop a standardized formulation for the herbal gel for pediatric dosage, incorporating dikamali extract along with mango leaves extract and other suitable ingredients.

- Experiment with different formulations, ratios, and manufacturing processes to optimize the therapeutic value, stability, and pharmacological action of the dikamali gel.

5. Evaluation of Dikamali Gel:-

Here are some parameters used to evaluate gels:

- pH: A very important parameter that affects gelation, as a change of even 0.1 pH units can dramatically change gel properties.

- Spreadability: How well a gel spreads when applied to the skin or an affected area.

- Rheological studies: An important index for evaluating gels, as studying rheological changes can help evaluate gelation speed.

- Viscosity: Affects the spreadability, extrudability, and release of drugs.

- Gelling capacity: A simple method for determining the rate of gel formation and degradation.

- Stability: An important parameter that can be characterized by the instability index, which ranges from 0 for a stable gel to 1 for an unstable gel.

- Differential Scanning Calorimetry (DSC): A

technique used to characterize the thermal properties of a gel by measuring the amount of heat needed to increase the temperature of a sample.

- **Ex vivo permeation:** A method that can be used to correlate an in vitro environment with an in vivo environment.

Other parameters that can be used to evaluate gels include homogeneity, grittiness, drug content, extrudability, and skin irritation studies.

➤ **GARDENIA GUMMIFERA:-**

Gardenia gummifera Linn. f. is a well-known plant found in the tropical natural forest with

extensive traditional uses. Since most people today are unaware of the importance and specific use of this species, the review aims to create awareness among researchers and other people about its use and ethnomedicinal importance. In the Indian system of medicine *Gardenia Gummifera* is one of the important drugs which act as an antispasmodic, antiseptic, anthelmintic, sedative and stimulant.

Gum and resins are one of the important drugs in Unani, Ayurvedic system of medicine for curing the disease such as fevers, sexual debilities, cough, cold, dysentery, and diarrhoea. The therapeutic value of possess Anti-inflammatory, Anti-arthritis, Anti-rheumatoid, Anti-diarrhoeal, Anti-hyperlipidemia, Anti-asthmatic, Anti-cancer, Anti-microbial and analgesic also act as a hepatoprotective and immunomodulatory

➤ **MAGNIFERA INDICA:-**

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Mangifera indica (MI), also known as mango, is an important herb in the

Ayurvedic and indigenous medical systems for over 4000 years. Mangoes belong to the genus *Mangifera* which consists of about 30 species of tropical fruiting trees in the flowering plant family Anacardiaceae. According to Ayurveda, varied medicinal properties are attributed to different parts of the mango tree.

Mango is one of the most popular of all tropical fruits. Mangiferin, being a polyphenolic antioxidant and a glucosyl xanthone, it has strong antioxidant, anti-lipid peroxidation, immunomodulation, cardioprotective, hypotensive, wound healing, antidegenerative and antidiabetic activities.

Various parts of the plant are used as a dentifrice, antiseptic, astringent, diaphoretic, stomachic, vermifuge, tonic, laxative and diuretic and to treat diarrhoea, dysentery, anaemia, asthma, bronchitis, cough, hypertension, insomnia, rheumatism, toothache, leucorrhoea, haemorrhage and piles. All parts are used to treat abscesses, broken horn, rabid dog or jackal bite, tumour, snakebite, stings, datura poisoning, heat stroke, miscarriage, anthrax, blisters, wounds in the mouth, tympanitis, colic, diarrhoea, glossitis, indigestion, bacillosis, bloody dysentery, liver disorders, excessive urination, tetanus and asthma.

Ripened mango fruit is considered to be invigorating and refreshing. The juice is restorative, tonic and used in heat stroke. The seeds are used in asthma and as an astringent. Fumes from the burning leaves are inhaled for relief from hiccups and affections of the throat. The bark is astringent, it is used in diphtheria and rheumatism, and it is believed to possess a tonic action on the mucous membrane. The gum is used in dressings for cracked feet and for scabies. It is also considered anti-syphilitic. The kernels are converted into flour after soaking in water and eliminating the astringent principles. Most parts of the tree are used medicinally and the bark also contains tannins, which are used for the purpose of dyeing.

➤ **DIKAMALI:-**

Synonym:-

Gardenia Gummifera Linn, *Gardenia*, *Hingupatri*, *Venupatri*, *Suvirya*, *panga*, *resinifer*, *Gandharaj*

Biological source: *Dikamali* is obtained from *Gardenia lucida* which belongs to the family Rubiaceae. It is a gum resin which exudes from the leaf buds of *G. lucida*.

Geographical sources:-

native to the tropical and subtropical regions of Africa, Asia, Madagascar, Pacific Islands and Australia, Andhra Pradesh, Kerala, Tamil Nadu.

Fig.2 Dikamali stem.



Cultivation and collection and morphology:-
 .It was once widespread in the rocky terrains with fragmented distribution along with its habitat and mountainous regions. The plant thrives well under an normal range of rainfall and temperature but may also partly dry during harsh summers. its ability to withstand differences in temperature and rainfall conditions to a great extent, the plant is inevitably facing extinction as usual, an undersized tree or a large woody flowering shrub that grows about 37 m in height with a yellowish-white trunk with a hard texture. The leaves are discrete with 10-16 pairs of the lateral nerve that contains a dot like gland recognized as 'Domatia' at the axils of each nerve. The leaves are simple, rather sessile, elliptic, oblong, 4-8 cm long, and have a shiny appearance. The leaves appear similar to guava leaves and on plucking the leaves or incising the bark, a yellow gum is secreted on the surface of the bark. The flowers which bloom in June – July, are yellowish, bisexual with characteristic fragrance, 4-7 cm in length, solitary and axillary. The petals are white and change yellow, with a tubular-based corolla with 5-9 lobes from 5-12 cm diameter. Fruits are known as a berry, with many seeds. Fruits are ovoid with fleshy mesocarp, and edible, and found in August to October. The propagation is usually by seeds, which are spread by birds that feed on the fruits. Sometimes mature fruits fall on the ground releasing seeds, which germinate under favorable conditions.

6.

an excellent pain killer and acts as an antiseptic for healing wounds

MANGO LEAVES -

Synonym: *Mangifera indica* mango tree.

Biological Source:- Mangoes belong to genus *Mangifera* which consists of about 30 species of tropical fruiting trees in the flowering plant family Anacardiaceae. According to ayurveda, varied medicinal properties are attributed to different parts of mango tree. Mango is one of the most popular of all tropical fruits.

Geographical Sources:- southern Asia, particularly the region between northwestern Myanmar, Bangladesh, and northeastern India.

➤ **Taxonomical classification:-**

Kingdom: Plantae Division: Angiospermae Class: Dicotyledoneae Order: Gentianales Family: Rubiaceae Genus: *Gardenia* Species: *G. gummifera*
 Chemical Constituents:- dikamali contains Resin- 89.9, Volatile oil-0.1, Plant impurities-10%. Chemical investigation of dikamali gum reports that Six new cycloartane triterpenes, dikamaliartanes A-F1-6, together with a known flavonoid 7, Plant impurities-10%.

➤ **Uses:-**

1. Digestive problems
2. Astringents
3. Expectorant for nervous conditions and spasm
4. Antimicrobial, Insecticidal, Antiradical Activity
5. Antispasmodic, carminative, Anthelmentic



Fig.3Mangoleaves



Cultivation, collection and morphology:-

Dikamali thrives in warm, humid climates and requires well-drained, fertile soil to grow. It prefers full sunlight but can also tolerate partial shade. The plant should be watered regularly and pruned to maintain its shape and encourage new growth. Leaves are spirally arranged on branches and each node of the stem has one leaf pointing in opposite direction. Young leaves are copper-colored, turning to light then dark shiny green. Young flower buds can be coppery red to bronze in color.

Leaves can be up to 30 cm long and 7 cm wide, and are usually narrowly elliptical to lanceolate in shape. They can also be linear-oblong and pointed at both ends. Leaves have a yellow midrib that is quite visible, and their margins can be entire or slightly undulate. They are somewhat leathery, with nerves that are elevated on both surfaces. When crushed, mango leaves release an aromatic odor. Tree is medium to large (10-40 m in height), evergreen with symmetrical, rounded canopy ranging from low and dense to upright and open. Bark is usually dark grey-brown to black, rather smooth, superficially cracked or inconspicuously fissured, peeling off in irregular, rather thick pieces. The tree forms a long unbranched long tap root (up to 6-8 m and more) plus a dense mass of superficial feeder roots. Effective root system of an 18-year old mango tree may observe a 1.2 m depth with lateral spread as far as 7.5 m [8]. The leaves are simple alternately arranged, 15-45 cm in length. The petiole varies in length from 1 to 12 cm, always swollen at the base. Leaves are variable in shape like oval-lanceolate, lanceolate, oblong, linear-oblong, ovate, obovate-lanceolate or roundish-oblong [9]. The upper surface is shining and dark green while the lower is glabrous light green. Hermaphrodite and male flowers are produced in the same panicle, usually with a larger number of the latter. The size of both male and hermaphrodite flowers varies from 6 to 8 mm in diameter. They are sessile, rarely pedicellate, and have a sweet smell. The pollen grains are of variable shapes, with the size varying from 20 to 35 micron [10-11]. The fruit is more or less compressed, fleshy drupe, varies considerably in size, shape, colour, presence of fibre, flavour, taste and several other characters.

Leaves: Used as astringent, refrigerant, styptic, vulnerary and constipating. They are also

useful in vitiated conditions of cough, hiccup, hyperdipsia, burning sensation, hemorrhages, haemoptysis, haemorrhoids, wounds, ulcers, diarrhoea, dysentery, pharyngopathy, scorpion sting and stomachopathy. The ash of burnt leaves are useful in burns and scalds. The smoke from burning leaves is inhaled for relief of throat diseases.

Taxonomical classification:

Kingdom : Plantae Class : Mangoliopsida
Phylum: Mangoliophyta Order: Sapindales
Family: Anacardiaceae Genus : Mangifera Species : Indica

Chemical Constituents:-

1. Carbohydrates: Structural carbohydrates like cellulose and pectins, and sugars like ascorbic acid
2. Lipids: Omega-3 and omega-6 fatty acids, which increase during ripening
3. Pigments: Chlorophylls (a and b), carotenoids, and xanthone indole-like mangiferin
4. Organic acids: Malic and citric acids
5. Amino acids: Lysine, leucine, cysteine, valine, arginine, phenylalanine, and methionine
6. Polyphenols: Quercetin, catechins, tannins, kaempferol, anthocyanins, gallic acid, and ellagic acid
7. Phenolic acids: Coumaric acid, ferulic acid, and hydroxybenzoic acid
8. Esters: Ethylbutanoate, methylbenzoate, and ethyl 1-2-methylpropanoate

Uses:-

- Diabetes
- Bronchitis
- Diarrhea
- Asthma
- Scabies
- Respiratory problems

- Urinary disorders.

III. EXPERIMENTAL WORK

1. Material use:-

INGREDIENT	QUANTITY	USE
Sucrose	44gm	Sweetening agent
Carbopol	2gm	Rheological modifier
Triethanolamine	1ml	pH adjuster
Propyleneglycol	7.5ml	Emollient
Methylparaben	0.9gm	Humectant
Propylparaben	0.01gm	Humectant
Glycerine	2.5ml	Soothing agent
Alcohol	7.5ml	Preservative
Beetroot extract	Q.S.	Colouring agent
Dikamali extract	12.5ml	Drug extract
Mango leaves extract	12.5ml	Antidiarrheal drug
Rose oil	Q.S.	Fragrant

Quantity given for 100 gm of gel.

2. Instrument use:-

Sr.No.	Name of instrument
1	Brookfield viscometer

3.

4. Material and method :

The gum Dikamali was procured in local market. It is based upon the anatomical character of the vegetative residue filter from the D distilled water of the commercial gum. The source was determined. The proximate chemical analysis was carried out, which included extractives that dissolve in water, alcohol, resin, and plant remnants were determined for crude commercial drug by Indian Pharmacopoeia. Acid value and saponification value was determined by the photometric titration method. The drug was powdered and extracted by

decoction procedure by distilled water. The extract of Gardenia was subjected to thin layer chromatography on silicagel G. layer of them were determined for crude commercial drug by Indian Pharmacopoeia. Acid value and saponification value was determined by the photometric titration method.

5. Formulation of Dikamali gel :-

➤ Extraction of Dikamali:-

-

Dikamali resin (obtained from the leaves and buds and

young sand then it is filtered to get the extract of desired chemical constituent i.e. resin shoots of Gardenia Gummifer was extracted with distilled water with decoction process.

➤ **Extract of mango leaves:-**

Preparation of aqueous extract. Five grams of powder plants stem were extracted by 100ml of distilled water at room temperature for 24h by the process of maceration and then filter the extract with whatmann filter paper.

➤ **Preparation of gel:-**

1. Prepared the extract of magniferaindicaleaves.
2. Prepared the extract of gardeniagummifera.
3. Prepared the extract of beetroot.
- 4.

Weighed all the ingredient used in the formulation of Dikamali Gel.

- 5.
- Added 33.33 gm of sucrose to 48 ml of distilled water in 100 ml of Beaker properly stirred the solution.
6. Added 2 gm of carbopol to above solution.
7. Added triethanolamine to maintain the pH.
8. Added 7.5 ml of propylene glycol.
- 9.

Added the given quantity of methylparaben and propylparaben.

10. Added 2.5 ml of glycerin.
- 11.
- Stirred it properly in one direction to mix all the ingredients properly.
12. Added 7.5 ml of Alcohol and mix it properly.
- 13.

Added the extract of the Dikamali which is the main ingredient herbal preparation.

- 14.
- Added the extract of mango leaves which shows anti-diarrheal property
15. Add coloring agent which is beetroot extract.
16. Mixed it properly.

➤ **Evaluation parameter:-**

Here are some parameters used to evaluate gels:

- pH: A very important parameter that affects gelation, as a change of even 0.1 pH units can dramatically change gel properties.
 - Spreadability: How well a gel spreads when applied to the skin or an affected area.
 - Rheological studies: An important index for evaluating gels, as studying rheological changes can help evaluate gelation speed.
 - Viscosity: Affects the spreadability, extrudability, and release of drugs.
 - Gelling capacity: A simple method for determining the rate of gel formation and degradation.
 - Stability: An important parameter that can be characterized by the instability index, which ranges from 0 for a stable gel to 1 for an unstable gel.
 - Differential Scanning Calorimetry (DSC): A technique used to characterize the thermal properties of a gel by measuring the amount of heat needed to increase the temperature of a sample.
 - Ex vivo permeation: A method that can be used to correlate an in vitro environment with an in vivo environment.
- Other parameters that can be used to evaluate gels include homogeneity, grittiness, drug content, extrudability, and skin irritation studies.

IV. RESULT AND DISCUSSION

Based on the study, five distinct batches of Dikamali Gel were formulated. Among these batches, the F5 batch exhibited optimized results for the properties of the Dikamali Gel. Consequently, the evaluation parameters were specifically assessed for the F5 batch to determine its effectiveness and therapeutic action of drug. It seems that Dikamali gel gives pharmacological action against irritation, inflammation and diarrhea.

V. SUMMARY AND CONCLUSION:-

In conclusion, the dikamali multipurpose gel formulation has shown promising results. It effectively shows anti-inflammatory, anti-irritant, anti-diarrheal, activity. Sensory evaluation confirmed its pleasant color, odor, and consistency.

Performance testing and application process indicated it's ease of use. Stability studies revealed consistent quality over time, and safety assessments demonstrated good tolerance for children. Overall, dikamalimultipurpose gel offers a simple and effective solution for easy teething process.

➤ Future scope

The future scope of Dikamaligel, particularly in the context of Ayurvedic and herbal medicine, holds promising potential in several areas:

- **Pharmaceutical and Dermatological Applications:** With more research and clinical trials, Dikamali gel can be developed into a standardized product for treating skin conditions, inflammation, and pain relief. It could find applications in mainstream pharmaceutical and cosmetic products.
- **Natural and Organic Products Trend:** As the demand for natural, organic, and herbal skincare and healthcare products continues to rise, Dikamaligel could gain popularity in the wellness and cosmetic industry. Its natural anti-inflammatory and antimicrobial properties make it attractive for eco-friendly formulations.
- **Development of New Formulations:** Researchers and companies may explore new formulations by combining Dikamali with other herbal ingredients to enhance its efficacy and expand its use in areas such as anti-aging, acne treatment, and wound care.
- **Pain Management Solutions:** Dikamali gel could find a broader market in pain management, especially for those looking for non-steroidal, plant-based alternatives to treat chronic pain, arthritis, and joint issues.
- **Global Market Expansion:** With the growing interest in Ayurvedic and traditional medicines in global markets, there is a potential for Dikamali gel to be marketed internationally, provided there are appropriate studies validating its benefits.
- **Scientific Research and Validation:** Further studies on the active compounds in Dikamali could open doors to understanding

its full range of therapeutic effects, leading to its application in new therapeutic areas like immune support, allergy relief, or even cancer research.

REFERENCE:-

- 1) SUMAD., RAJIR. NANDMSLATHA, International journal of pharmacognosy and phytochemical research 2021; 12(4); 29-37 research scholar of bioscience, Mahatma Gandhi University, Priyadarshini hills kottayam, KERALA, INDIA .
- 2) Indian medicinal plants – an illustrated dictionary. C.P. Khare complimentary and alternative medicine 2007
- 3) ANANDKUMAR, A., MURALIDHARAN, R. ANDBALAKRUSHNAM, M. analytical laboratory, Indian Medical Practitioners Co-operative Pharmacy and Stores Ltd., Adyar, Madras 600020, India
- 4) Sivasankar Mohanty*, Krishna Mohan G *Centre for pharmaceutical sciences, Institute of Science and Technology, Jawaharlal Nehru Technological University-Hyderabad, Kukatpally, Hyderabad, Andhra Pradesh, India. *Corresponding author's E-mail: smohanty55@gmail.com
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- 6) Journal of pharmacognosy and phytochemical available online at www.phytojournal.com
- 7) Sharif MDM, Banik GR. status and utilization of medicinal plants in Rangamati



at
Bangladesh. Research journal of Agricultural and Biological science. 2006;2(6):268- 273

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