



# FORMULATION DEVELOPMENT OF POLYHERBAL GEL FOR MAIN ACTIVE CONSTITUENTS OF GILOY TREATMENT OF ARTHRITIC DISEASES

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## ABSTRACT

*Tinospora cordifolia*, popularly referred to as "Guduchi," possesses several therapeutic properties, such as anti-inflammatory, anti-periodic, anti-arthritis, anti-oxidant, anti-allergic, and anti-stress properties[2]. After the COVID-19 pandemic, a large number of individuals developed autoimmune diseases, including rheumatoid arthritis (RA), an autoimmune illness characterised by persistent inflammation of the synovial joints that leads to severe bone loss. About 5 million people are affected globally, and 50% of them lose their ability to work after 20 years of diagnosis. Because they have fewer side effects, herbal medications are currently the most popular choice for treating chronic illnesses. The majority of plants and their species that are extracted using various extraction techniques and are in some way safe for use are used in the development of herbal drugs. The goal of the current project is to create a polyherbal gel with zinger, guduchi, and honey to treat rheumatic illnesses. Using synthetic gel bases such as propylene and carbopol, triethanolamine, glycol, etc. The prepared gel was assessed for a number of physicochemical characteristics, including pH, viscosity, spreadability, extrudability, and physical appearance. A France diffusion cell was also used to conduct an in vitro diffusion investigation[3].

**KEYWORDS:-** Guduchi, Zinger, Honey, Polyherbal gel.

## INTRODUCTION

World Health Organization (WHO) has defined herbal medicines as finished, labeled medicinal products that contain active ingredients, aerial or underground parts of the plants or other plant material or combination. Herbal formulations have reached widespread acceptability as therapeutic agents like anti-microbial, anti-diabetic, anti-ageing, anti arthritic anti-depressant, anti-anxiety, anti-inflammatory, anti-HIV, treatment of cirrhosis, asthma, migraine, Alzheimer's disease and memory enhancing activities[4,8]. Herbal medicines have been always in demand because of their potentials and minimal side effects, and thus the research on

plant-based medicines for their activity and formulations is constantly in interest. For topical treatment of dermatological disease as well as skin care, a wide variety of vehicles ranging from solids to semisolids and liquid preparations is available to clinicians and patients. Within the major group of semisolid preparations, the use of transparent gels has expanded both in cosmetics and in pharmaceutical preparations. Gels are defined as semi-rigid systems in which movement of the dispersing medium is restricted by an interlacing three dimensional network of particles or solvated macromolecules of the dispersed phase. Gels have better potential as a vehicle to administer drug topically in comparison to ointment, because they are non-sticky, require low energy during formulation, are stable and have esthetic value [9]. Traditionally, *Tinospora cordifolia* (Willd.) Hook. F. and Thomson (Menispermaceae) commonly known as rasayana plant, Guduchi, is one of the commonly used medicinal plants in India for curing ailments ranging from common cold, skin diseases, and dental infections to major disorders such as diabetes, hypertension, jaundice, and rheumatism, and its rejuvenating property is well-reported in Ayurvedic and other ancient literature. This plant is used as stomachic, antipyretic, analgesic, anti-inflammatory, anti-diarrheal, and in fracture of bones in animals [10,15]. Rheumatoid arthritis (RA) is an autoimmune disease characterized by the chronic inflammation of synovial joints which results in severe bone destruction[16]. It affects approximately 5 million people worldwide of which 50% are unable to work beyond 10 years of diagnosis[17]. A number of anti-inflammatory and anti-rheumatic drugs used in treatment of RA have been developed over the past few decades, but still there is an urgent need for more effective drugs with lower side effects[18]. Non-steroidal anti-inflammatory drugs (NSAIDs) play vital role along with disease modifying anti-rheumatoid drugs (DMARDs) in the management of RA. It is now recognized the NSAIDs are effective in relieving the symptoms of the disease. However, they do little to overcome the main underlying cause, and in some instances may contribute to its progression. In the same line, though various drugs have been used to control RA there are numerous reports regarding the side effects of these drugs. This further suggests a need of effective as well as safe alternative therapy for the radical treatment of RA[19]. The stem of Guduchi helps in inflammation and arthritis. It also helps in alleviating joint pain and many other symptoms associated with arthritis. Rheumatoid arthritis can be managed by consuming powdered Guduchi stem mixed with ginger.



**Fig. 1 Giloy Stem**

- **Synonyms-** Ambervel
- **Botanical name-** *Tinospora cordifolia*
- **Kingdom –** Plantae

- **Clade** – Angiosperms
- **Order** – Ranunculales
- **Family** –Menispermaceae
- **Genus** – Tinospora
- **Species** – T. Cordifolia

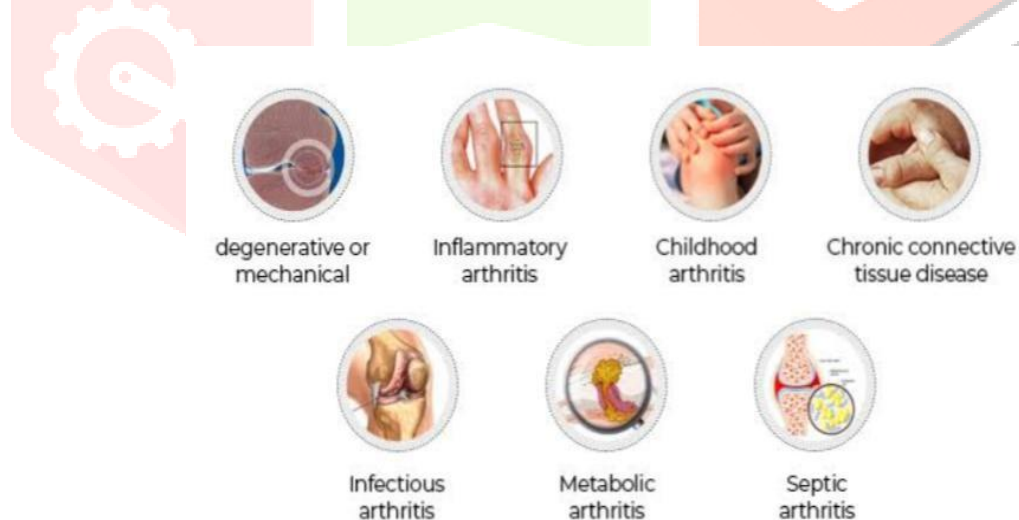
## AIM

Formulation development of polyherbal gel for main active constituents of giloy treatment of arthritic diseases.

## OBJECTIVE

- Anti-cancer
- Anti-inflammatory
- Anti-ageing
- Immunity enhancer
- Anti-diabetic (reduce the blood sugar level)
- Anti-arthritic (helps to mitigate the joints pains associated with arthritis)
- Anti-aircraft Stress
- Anti-allergic (helps to fight allergic reaction)

## ARTHRITIS CAUSES IN HUMAN BODY



**Fig. 2 Cause of arthritis disease**

## MATERIAL

### Chemical

- Carbopol
- Propylene glycol
- Triethanolamine
- Disodium EDTA
- Sodium Benzoate

## Natural herbal plants

### Giloy

- **Biological name-** Tinospora cordifolia
- **Common name-** Amrita
- **Chemical constituents-** Terpenoid, alkaloid, lignans, steroids.
- **Part typically used-** Stem
- **Colour-** Green
- **Used** – it's used for anti-inflammatory, prevent the arthritic disease, diabetes, corona, dengue.



Fig. 3 Giloy

### Zinger

- **Biological name-** Zingiber officinale Roscoe
- **Common name-** Adrack
- **Chemical constituents-** Phenolic compounds, terpenes, polysaccharides, lipids,
- **Part typically used-** Stem
- **Colour-** Yellow
- **Used** - Ginger has also been used to help treat arthritis, colic, diarrhea, and heart conditions.



Fig.4 Zinger

### Honey

- **Biological name** - Apis mellifera
- **Common name** - Madhu
- **Constituents** -Dextrose , Laevulose
- **Colour** - Nearly colorless to dark brown

- **Used** - These nutrients will also help boost your immunity and reduce your chances of developing auto-immune arthritis.



**Fig. 5 Honey**

## **METHODS**

- ❖ Fresh giloy stem are collected from local area of bharnewadi. The giloy stem is dried in shade and then stem grinded to form a fine powder. For giloy stem powder were by using soxhlet extraction method.
- ❖ After soxhlet extraction method collected from giloy extraction.
- ❖ Fresh Zinger rhizomes are collected from local area of bharnewadi. The rhizomes of zinger were extracted by using soxhlet extraction method.
- ❖ Zinger was taken from market, cleansing them. Chopping of cleaned zinger and make into slices. Take 25 gm of chopped zinger and 100 ml of solvent (methanol).
- ❖ Zinger slices and methanol were transfer into soxhlet apparatus, heat at 80°C for 8 h. Receiver collects the concentrated extract.
- ❖ Filtration of extract and further centrifuge extract. The distillation of centrifuged extract was done and zinger oil was obtained[20].



**Fig.6 Giloy soxhlet extraction**

## **Preparation of gel base**

Carbopol 934 was dissolved slowly with stirring in 60 mL of demineralized water for 1 h to avoid agglomeration. Then disodium edetate and triethanolamine were dissolved in 10 mL of demineralized water separately and stirred for 10 min. Mixed 4.83 mL of propylene glycol in 12 mL of demineralized water with stirring for 10 min. Disodium edetate and triethanolamine solution were added to carbopol solution and the

pH was then adjusted to 7.4 by stirring the solution for 10 min. Then propylene glycol solution was added with stirring for 10 min until a clear consistent gel base was obtained.

### FORMULATION OF POLYHERBAL GEL [21]

Ingredients	Q1	Q2	Q3	Q4
Giloy extract	1%	1.5%	2%	2.5%
Zinger extract	1%	1.5%	2%	2.5%
Honey	0.5%	1%	1.5%	2%
Carbopol 934	1.5%	1.5%	1.5%	1.5
Propylene glycol	20%	40%	60%	20%
Triethanolamine	1.5%	1.5%	1.5%	1.5%
Disodium EDTA	0.5%	0.5%	0.5%	0.5%
Sodium benzoate	0.05%	0.05%	0.05%	0.05%
Distilled water	q.s 5gm	q.s 5gm	q.s5gm	q.s5gm

**Table. 1 Formula of polyherbal gel**

### PROCEDURE

- Take this one beaker then added of giloy extract and zinger extract.
- This both extract added to the gel base.
- Proper mix the extract and gel base.
- Then added of the honey and mix it.
- Collect the gel from the container.

### EVALUATION TEST [22,23]

#### PH

pH of individual and polyherbal gel formulation was determined by using a digital PH meter .



## Appearance and Homogeneity

The developed individual and polyherbal gels were evaluated for physical appearance and homogeneity by visual observation found that all formulations are Yellowish, smooth, translucent.

## Viscosity

The viscosity of individual and polyherbal gels was measured by Brookfield viscometer , an average viscosity found to be 0.3792 to 0.3810 poise.

## Spreadability

The spreadability of the gel formulations was determined by measuring the spreading diameter of 1 g of gel between two glass slide which was compressed to Uniform thickness by applying after one min. The standard weight applied on the upper plate was 125 gm, spreadability found to be 31.63 to 33.91..

## Skin irritation studies

The intact skin was used. The gels containing extracts were used on skin. finally the treated skin was examined visually no skin irritation and no side effect



## RESULT

Parameters	Result
PH	7.20
Viscosity	0.3789
Spreadability	31.78
Skin irritation test	No side effects
Physical appearance	Greenish Yellow smooth, Translucent

Table. 2 Result

## DISCUSSION

Using carbopol 940 as the gelling base, a polyherbal gel including giloy extract, zinger extract, and honey is made and tested for the treatment of rheumatic illnesses. These formulations of prepared gel were created, and each formulation performed well in the evaluation parameters. Guduchi gel was not created with antibacterial properties in mind. The therapeutic properties of *T. Cordifolia* are widely recognized. Thus, study effectively formulates and elevates one more Guduchi arena.

## CONCLUSION

Four formulation of a polyherbal gel comprising giloy, zinger, and honey with carpool are made, and each formulation is assessed for a variety of physicochemical properties. The resulting gel had a smooth, transparent appearance and wasn't oily or sticky. This kind of gel formulation is not a substitute for full treatment of chronic conditions, although it can help with pain relief and inflammation. Polyherbal gel can be the best substitute for the treatment of rheumatic diseases.

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