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FORMULATION AND EVALUATION OF ANTI - INFLAMMATORY TABLET FORM ANACYCLUS PYRETHRUM ROOT EXTRACT

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Abstract:

The formulation and evaluation of an anti-inflammatory herbal tablet from Anacyclus pyrethrum root extract is a critical process aimed at developing a natural remedy for inflammation-related conditions. This abstract will provide a brief overview of the methodology and findings of the study.

The study involves the extraction of bioactive compounds from Anacyclus pyrethrum root, known for its anti-inflammatory properties. These compounds are then formulated into a tablet using excipients and binders to ensure stability and bioavailability. Various physicochemical parameters of the tablet such as weight variation, hardness, friability, and disintegration time are evaluated to assess its quality.

Furthermore, the anti-inflammatory activity of the herbal tablet is tested using in vitro and in vivo models. The inhibition of pro-inflammatory markers such as cytokines and enzymes are measured to determine the efficacy of the tablet in reducing inflammation. Additionally, the tablet's safety profile is evaluated through acute and sub-acute toxicity studies to ensure its suitability for human consumption.

Overall, the formulation and evaluation of an anti-inflammatory herbal tablet from Anacyclus pyrethrum root extract show promising results in terms of its potential therapeutic benefits and safety profile. This natural remedy has the potential to offer a safer alternative to synthetic anti-inflammatory drugs with fewer side effects.

Keyword : Anti-Inflamentory , Anti-Pyratic.

Introduction: -

The aim of this study to formulate standard dose of herbal tablet from methanolic extract of Anacyclus pyrethrum and Anacyclus pyrethrumr root powder and to determine suitable binder for formulation. n Ayurveda, Unani medicine, and other traditional healing practices, Anacyclus pyrethrum is considered a potent herbal remedy with diverse applications. The root of the plant is known for its stimulant, aphrodisiac, anti-inflammatory, and analgesic properties. It contains bioactive compounds such as alkylamides, sesquiterpene lactones, and flavonoids that contribute to its pharmacological effects. Anacyclus pyrethrum has been traditionally used to address a wide range of health issues, including digestive disorders, respiratory ailments, toothaches, and sexual dysfunction. It is also valued for its ability to stimulate circulation, improve vitality, and enhance overall well-being. The plant's root extract is often prepared in various forms, such as powders, tinctures for internal consumption or topical application.

Herbal drugs :-

Herbal drugs are derived from plants or their parts by converting them into pharmaceutical through simple process like harvesting, drying, and storage. Herbal medicine has been used for thousands of years. It is estimated that 80% of world population rely on traditional herbal medicine for primary health care. In recent years, herbal remedies have been considered as dietary supplement for disease prevention and as alternative/complementary medicine. A wide variety of herbal medicines are readily available in the market all over the world. With the rising utilisation of herbal products, safety and efficacy of herbal medicine have become a public health concern. Adverse health effects associated with herbal products could be attributed to both inherent toxic effects of herbal medicine and toxicities induced by adulterants/contaminants. Increasing evidence, regarding side effects of herbal medicine, has highlighted the demand and necessity of toxicological studies for herbal products. Toxicology constitutes an essential role in the development of herbal medicines.

Present Interest in Herbal Drugs: -

Herbal medicine is considered by many to offer an alternative treatment for various diseases, particularly lifestyle diseases that require lifelong pharmaceutical medication and thus raises safety concerns. It is also believed by traditional medical practitioners that the phytoconstituents present in herbal medicine have better compatibility with the human system. Phytochemicals present in herbs are being actively investigated for direct use as therapeutic agents and as prototype lead compounds for the development of new synthetic or semisynthetic drugs. The availability of high-throughput screening for target-based drug discovery, libraries containing a large number of highly pure phytochemicals, laboratory animal models simulating human diseases, profiling kits for drug

toxicity studies, and bioinformatics database for long-term safety prediction have renewed research interest in herbal medicine globally towards the discovery of new drugs. Importance of herbal drugs and current status: The earliest evidence of human's use of plant for healing dates back to the Neanderthal period (Winslow and Kroll,1998). Herbal medicinal is now being used by an increasing 3 number of patients who typically do not report to their clinicians concomitant use (Miller, 1998). There are multiple reasons for patients turning to herbal therapies. Often cited is a "sense of control, a mental comfort from taking action, which helps explain why many people taking herbs have diseases that are chronic or incurable viz. diabetes, cancer, arthritis or AIDS. In such situations, they often believe that conventional medicine has failed them. When patients use home remedies for acute, often self-limiting conditions, such as cold, sore throat, or bee sting, it is often because professional care is not immediately available, too inconvenient, costly or time-consuming.

Path to improved health: -

Herbal products and supplements are intended to maintain health or treat health problems. However, as mentioned above, they are not regulated by the FDA. This is because the FDA considers herbal supplements to be food, not drugs. An herbal supplement's label can say how it might help, but it cannot claim to be a treatment for a disease or illness. According to the FDA, "Dietary supplements are not intended to treat, diagnose, cure, or alleviate the effects of diseases." The National Institutes of Health provides a good guide that shows how specific herbs and supplements may be used. For example, people often take the following herbs in the following ways: 1. American ginseng is taken to reduce stress, boost the immune system, improve digestion, and more. 2.Chamomile is taken to improve sleep quality, reduce anxiety, and help gastrointestinal conditions.3. Cinnamon is taken to treat gastrointestinal problems, loss of appetite, and diabetes. There are many herbal products and supplements that promise to treat a range of symptoms. However, talk to your family doctor before you begin taking anything new. Never take more than the recommended dose on the label, and always check with your doctor to make sure the supplement won't interfere with any medication you already take.

Are herbal health product and supplements safe?

Herbs aren't necessarily safer than the ingredients in over-the-counter (OTC) and prescription medicines just because they come from nature. In fact, several prescription medicines are chemicals that were found in nature and purified. Although herbal health products and supplements are advertised as "natural," their ingredients aren't necessarily natural to the human body. They may have strong effects on your body. They can also cause unpleasant health effects (also called adverse effects). Researchers have studied the benefits and risks of some herbal health products and supplements. Others need to be studied more. Are herbal health products and supplements regulated by the U.S. Food and Drug Administration (FDA)? The FDA doesn't require proof of their safety and effectiveness to diagnose, prevent, treat, or cure health conditions. That's because the FDA defines dietary supplements as food, not as drugs. It's up to the manufacturer to be sure that an herbal health product or supplement is safe before it is sold. The FDA can take herbal health products or supplements off the market if they are found to be unsafe (for example, if they cause serious adverse effects) or are found to contain ingredients that aren't listed on the label (for example, harmful substances).

Benefits of Ayurvedic herbs: - 1. Balance your dosha's and provide complete relief from an existing illness.

2. They are treating as a whole individual, so this type of treatment can give you a side advantage to cure other health problems with the main disease.

3. It is a natural line of treatment with no or fewer benefits.

4. It improves vitality and provides strength.

5. They boost your immunity and increase your natural power of healing.

According to the Indian Pharmacopoeia Pharmaceutical tablets are solid, flat or biconvex dishes, unit dosage form, prepared by compressing a drug or a mixture of drugs, with or without diluents.

Tablet is defined as a compressed solid dosage form containing medicaments with or without excipients.

They vary in shape and differ greatly in size and weight, depending upon number of medicinal substances and the intended mode of administration.

Literature survey

Sr.no	Title	Author	Summary

1	Anacyclus pyrethrum (L): Chemical Composition, Analgesic, Anti-Inflammatory, and Wound Healing Properties	Fatima Zahra Jawhari 1,,Abdelfattah El Moussaoui 1,Mohammed Bourhia 2,,Hamada Imtara 3,Hamza Mechchate ,Imane Es-Safi ,Riaz Ullah ,Essam Ezzeldin ,Gamal A. Mostafa ,Andriy Grafov ,Samir Ibenmoussa ,Dalila Bousta andAmina Bari	The study on Anacyclus pyrethrum revealed novel compounds with potential medicinal properties. Extracts from different plant parts exhibited significant analgesic, anti-inflammatory, and wound healing effects. These findings support the plant's traditional use in herbal medicine and suggest its potential for developing new therapeutic agents.
2	Phytochemistry, Biological and Pharmacological Activities of the Anacyclus pyrethrum (L.) Lag: A Systematic Review	Hanane Elazzouzi ,Kamal Fadili ,Ali Cherrat, Smail Amalich, Nadia Zekri, Hannou Zerkani, Imane Tagnaout, Christophe Hano , Jose M. Lorenzo andTouria Zair	The systematic review on Anacyclus pyrethrum by Elazzouzi et al. explores its phytochemical composition and pharmacological properties. The herb contains bioactive compounds with antimicrobial, anti-inflammatory, and antioxidant activities. Traditional uses include treating rheumatism, colds, and toothaches. Further research is needed to validate its efficacy and safety for therapeutic applications.
3	Biological studies of anacyclus pyrethrum	Sapna rani,vichitra Kaushik,Vipin Saini, Parminder nain	Anacyclus pyrethrum (Akarkara) root extract shows antibacterial, antidiabetic, antioxidant, anxiolytic, aphrodisiac, and memory-enhancing properties. Studies in animal models suggest potential benefits for Alzheimer's, diabetes, anabolic disorders, and reproductive health. Ethanol extraction yields promising results. Further research is needed to validate its therapeutic potential in humans.
4	Pharmacognostic and phytopharmacology study of Anacyclus pyrethrum	Afreen Usmani,mohd khushtar,Muhammad arif,mohd. Aftab Siddiqui,satya Prakash sing,md mujahid	Anacyclus pyrethrum, a member of the Asteraceae family, exhibits diverse pharmacological activities including anti-inflammatory, antibacterial, antiviral, and antioxidant effects. Its traditional use in folk medicine for pain, infections, and digestive issues highlights its therapeutic potential. Further research is needed to fully explore its medicinal properties and potential applications.
5	Comprehensive Review on Plant Anacyclus Pyrethrum and Analytical Methods for its Active Constituents	Prince Thakur1, Abhishek Saini , Anchal Gangotia , Astha Sharma , Amar Deep Ankalgi	Anacyclus pyrethrum, or akarkara, is a wild herb rich in phytochemicals like ester pyrethrine and pellitorine. It is used in traditional medicine for its aphrodisiac, analgesic, anti-inflammatory, and anticonvulsant properties. Studies suggest antimicrobial, antioxidant effects. Research is ongoing to explore its neuroprotective and memory-enhancing potential.

6	Formulation and evaluation of nutraceutical tablet using herbal drurs by direct compression method	ASHOK KUMAR PAL, Upendra Nagaich, Charu Bharti, Neha Gulati	to formulate and evaluate the nutraceutical tablets with different combination of herbal drugs. The compressed formulations were subject to several evaluation parameters like appearance, thickness, weight variation, hardness and friability.
7	Development and evaluation of orally disintegrating tablets by direct compression method	Deshmukh V.N, Zade N.H, Sakarkar D.M	Formulation & evaluation of fast dissolving tablet using direct compression
8	The theory and practice of industrial pharmacy	Lachman L, Liberman HA, Kanig JL	Preformualtion & postcompression evaluation.
9	Comparative analysis of different marketed formulation	Agarwal k et al	Standardization of herbal formulation for safety, efficacy & cultural acceptabilty. Comparative analysis of marketed formulations quality control.
10	Anti-inflammatory, Antinociceptive, and Antioxidant Activities of Methanol and Aqueous Extracts of Anacyclus pyrethrum Roots	Houria manouze, Otmane bouchatta,a.chemseddoha gadhi,mohammed bennis,Zahra sokar,saadia ba- Muhammed	Method of extraction

Ingredient of herbal tablet:

Sr.no	Material	supplier
1	anacyclus pyrethrum	Rural area from akole
2	Bentonite	GSL lab Gujrat
3	Methyl cellulose	GSL lab Gujrat
4	Magnesium state	GSL lab Gujrat
5	Talc	GSL lab Gujrat

6	Starch	GSL lab Gujrat
7	Lactose	GSL lab Gujrat

Formula of herbal tablet

Sr.no	Tablet ingredient	F1	F2	F3
1	Anacyclus pyrethrum	200	200	200
2	Starch	30	30	30
3	Lactose	166	166	166
4	Magnesium sterate	2	2	2
5	Talc	2	2	2
6	Bentonite	50	50	50
7	Methyl cellulose	50	50	50
	Total	500	500	500

Plant profile

Botanical name: - Anacyclus pyrethrum

Synonym :-Pellitory, akalakari, akarakara, dalmation, Akalkara

Taxonomy:-

Kingdom: Plantae

Division: Spermatophyta,

Sub–division: Angiosperms,

Class: Dicotyledons,

Sub class : Metachlamydae,

Order: Companulatae,

Family: Compositae or Asteraceae,

Genus: Anacyclus,

Species: Pyrethrum.

Genus: Anacyclus,

Species: Pyrethrum.

Fig.1.1 Anacyclus Pyrethrum

Chemical test:-

Test for alkaloids:-

Sr.no	Test	Observation	Inference
1	Dragendroffs test	Orange brown colour	Present
2	Mayers test	Precipitation	Present
3	Wagners test	Reddish brown colour	Present

Test for tannins:-

Sr.no	Test	Observation	Inference
1	5% fecl3 solution	Blue black colour	Present
2	Lead acetate	White ppt	Present
3	Dil. HNO3	Yellow colour	Present

Test for flavonoids:-

Sr.no	Test	observation	Inference
1	Shinoda Test: To dry powder or extract, add 5ml 95% ethanol/t-butyl alcohol few drop conc. HCL and 0.5 g magnesium turning.	Orange pink ,red to purpule colour appear	Present

2	Alkaline Reagent Test: Extract treated with a few drops of NaOH solution.	Intense yellow color which becomes colorless on addition of dilute acid.	Present

Test for glycosides:-

Sr.no	Test	observation	Inference
1	Test for deoxy sugars (Keller Killiani Test) 2ml extract,add glacial acetic acid one drop of 5% Fecl3 and conc. H2SO4	Reddish brown color appears at junction of the two liquid layers andupper layer appears bluish green.	Present

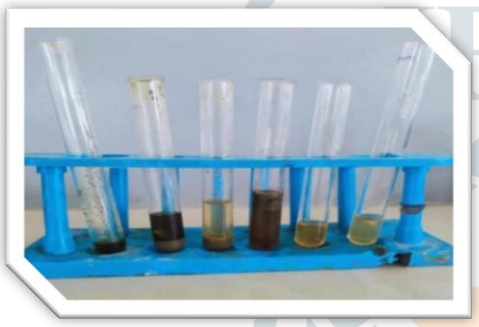

Fig1.8 Chemical Test Of Anacyclus Pyrethrum

Result :-

Test	F1	F2	F3
Shape	Round	Round	Round
Thickness	3mm	3mm	3mm
Hardness	6.00Kg/cm	5.50Kg/cm	6.00Kg/cm
Friability	0.8%	0.8%	0.8%
Disintegration Test	12min	12min	12min
Weight Variation	0.450	0.400	0.448

Conclusion :

The goal of this investigation has been achieved by preparing herbal tablet with the aid of analgesic and anti-inflammatory action.

the formulation and evaluation of an anti-inflammatory herbal tablet containing Anacyclus pyrethrum root extract demonstrate significant potential as a natural remedy for managing inflammatory conditions. The bioactive compounds present in Anacyclus pyrethrum, such as pyrethrins, pellitorine, and other phytochemicals, contribute to its anti-inflammatory properties. The tablet formulation offers a convenient and potentially effective way to harness the therapeutic benefits of this traditional medicinal plant. Further research and clinical studies are necessary to validate its efficacy, safety, and optimal dosage for use in treating inflammation-related disorders. Overall, Anacyclus pyrethrum root extract holds promise as a natural alternative in the treatment of inflammatory conditions

Future aspects-The results further suggest in vivo experimentation of the tablets for further exploration.

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