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PHARMACOLOGICAL INVESTIGATIONS OF AGERATUM CONYZOIDES

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ABSTRACT

The value of medicinal plants in the traditional health care systems (such as Ayurveda, Unani, Homoeopathy, and Yoga) for treating health issues is receiving more attention. Plant materials and herbal treatments made from them now make up a sizable share of the global health market as a result of this awareness. Herbal medicines rely on traditional knowledge and understanding of plants and their role in herbal medicine to survive. The usage of medicinal plants is one of the oldest, richest, and most distinctive living traditions in India, which is one of the world's top 12 biodiversity hotspots. Medicinal plants are regaining popularity, and this herbal "renaissance" is sweeping the nation and the world. Today's bioactive molecules show security in contrast to synthetics, which are thought to be detrimental to humans and the environment. Even though medicinal plants had long been prized for their curative, flavouring, and therapeutic properties, the chemical medications of the contemporary era diminished their significance. The blind reliance on synthetics has, however, come to an end, and people are turning to naturals in search of security and safety. The majority of people on earth rely primarily on natural goods for their health treatment. According to reports, natural compounds only account for 25% of the global market in industrialised nations like the United States, while they account for 80% of the market in China and India. Therefore, countries like India have a far greater worldwide significance for medicinal plants than the rest of the world. These nations include vast reserves of medicinal plants that are utilised in the rural populations' traditional medical systems.

KEY WORDS: Pharmacological, Analysis, Ageratum Conyzoides, Extraction Method.

INTRODUCTION

In the course of their daily operations, plants produce a variety of secondary metabolites, and the phytochemical analysis of a single plant may change over time due to varying conditions for plant growth. Researchers from many fields are looking for cures for various illnesses. A survey of 1000 plants and 156 clinical trials evaluating their potential for biocompatibility and therapeutic applications produced useful results. These results paved the way for the creation of medications and nutritional supplements made only from plant components. Due to their remarkable practical implications for therapeutic, dietary, and aesthetic usage, bioactive chemicals have garnered a great deal of attention in the last ten years. Over the course of evolution, both plants and microbes have acquired peculiar defence mechanisms. The diversity of secondary metabolites they produce, both chemically and structurally, and their interactions show that metabolites can be used to perform a variety of defensive tasks, from signal transduction to light/UV shielding and toxicity. As old as humanity itself, the use of natural medicines to treat various illnesses. The relationship between man and natural medicines has a lengthy history, as evidenced by the texts mentioned, the preserved herbarium, and even actual plant medicines. The understanding of the use of medicinal plants is the result of many years of battles against diseases, which taught man to look for remedies in diverse plant components. Plants have long been of particular interest, and current understanding has recognised their active involvement in the availability of medications. This also confirms that ancient humans dating back to the Neanderthal Man consumed bioactive chemicals. It is impossible to pinpoint the exact moment when humans invented the therapeutic use of particular plants for their advantage. However, plants like licorice, mint, henbane, and senna are mentioned in texts that date back to 2500 B.C.

Phytochemicals were known to all early civilizations, including the Babylonians, Hebrews, and Assyrians. Records from Egypt date back to 1,600 B.C. identifying the majority of medical professionals' use of bioactive products. The writings of Hippocrates, Theophrastus, Aristotle, and Pythagoras demonstrate that the Greeks were familiar with a variety of contemporary medications. The existence of the paranormal persisted in being widely known in their culture. Some people were regarded as intelligent because they could tell useful plants from poisonous ones. Rome paid little attention to plants that may treat a variety of illnesses. Galen and Pliny both recommended a few herbal remedies (Hill, 1952).

After the Dark Ages, a new period of encyclopaedists and herbalists began. The scientific institutes in Northern Europe built up huge collections of information about plants and their qualities, some of which were unproven. They placed a strong emphasis on plant mythology and their healing potential. This illogical notion claimed that all plants had a limited number of symbols, which they used to indicate and consume their intended purposes. Heart-shaped plant leaves were effective for relieving cardiac pain; liverleaf was superior for liver conditions, etc. Some plant common names can be traced back to this myth for their origin.

The trading of herbal drugs has the potential to be revolutionary. Researchers have discovered a variety of bioactive compounds utilised in traditional medicine that were obtained from "ethnomedical" plant sources. These are used as herbal drugs throughout the world and have contributed to the creation of numerous other medications. India has been using the Ayurvedic medical method for 5000 years. It contains dietary guidelines and herbal medicines that aid in the treatment and prevention of illness. Plants and their bioactive components are the sources of potent medications including atropine, codeine, digoxin, morphine, quinine, and vincristine, which have a long history of usage in modern medicine and in supportive systems of conventional medicine. In the latter half of the 20th century, the use of plants as medicine has increased significantly in developed countries. The herb itself is identified by the WHO monographs using a variety of criteria, such as geographic areas, studies to verify the medicinal plant, the active components, and their usage in medical pharmacology.

For the purpose of determining the active components in various sequential compounds, including their yields, the initial screening of plants for the presence of phytochemicals is highly useful. Extracts made from alcohol and water include a lot of bioactive substances. The majority of medicines' therapeutically effective metabolites are derived from primary metabolites that serve as the building blocks for their production. Primary metabolites are produced by plants in order to maintain normal growth, survival, and development.

As extraordinary medications with diverse therapeutic characteristics, a wide range of natural compounds are utilised, novel chemical compounds with potential therapeutic benefits can be found in medicinal plants. The discovery of new medications has been facilitated by the bioactive substances, which are a rich source of phytochemicals. In the primary healthcare systems in place today in developing nations, conventional medicine ought should be able to perform better. When compared to synthetic medications, natural drugs provide the human

body with an acceptable level of relief. Therefore, the primary goal is to maximise profit in order to offer rural residents adequate healthcare services.

Finding new sources of components with medical and industrial value requires a great deal of skill in the detection of the existence of various bioactive chemicals in plants. Launching crucial procedures for selecting plants for secondary metabolites is crucial. The current investigations aim to assess the phytochemical content of medicinal plant leaves in order to improve human health and to be used in pharmaceutical and nutraceutical foods of industrial significance.

RESEARCH METHODOLOGY

COLLECTION AND IDENTIFICATION OF EXPERIMENTAL PLANT

Prof. S. Kshetrapal (Dept. of Botany), University of Rajasthan, Jaipur, Rajasthan, India, gathered and identified mature, fresh, healthy, and disease-free plant materials of Verbesina encelioides and Ageratum conyzoides. For authentication, the University additionally received the voucher specimen numbers Verbesina encelioides (*RUBL211585) and Ageratum conyzoides (*RUBL211584). Fresh plant material was properly cleaned in tap water, dried in the shade, homogenised into a fine powder, and then stored in airtight bottles for future experiments.

EXTRACTION FROM PLANT MATERIAL

Extraction is the process of separating the mobile extracts from the immobile components by utilising successive solvents in accordance with established methods. The dried powdered plant material is uniformly packed in a round-bottomed flask that is filled with the required solvent, along with a thick filter paper—generally Whatmann filter paper—and placed inside the thimble-shaped equipment. The solvent is then decreased using heat after being put together with a condenser. The solvent starts to evaporate as it moves up to the distillation arm, where it collects in a chamber with a thimble of powdered material. The evaporating vapours must be made to cool down before collecting in the main collecting chamber, which holds the thimble of solid material.

Finally, the distillation flask is filled with the plant's raw extract. The most crucial aspect of this approach is that it only requires one batch of solvent to isolate bioactive chemicals. A

sticky solid residue is produced from the extracted components after the solvent has been removed from the extract using a rotary evaporator. In the current investigation, 200 ml of n-hexane, chloroform, ethyl acetate, methanol, and water were macerated with 10 g of powdered leaves, stems, and entire plant material (just the aerial part) by Soxhlet extraction at a certain

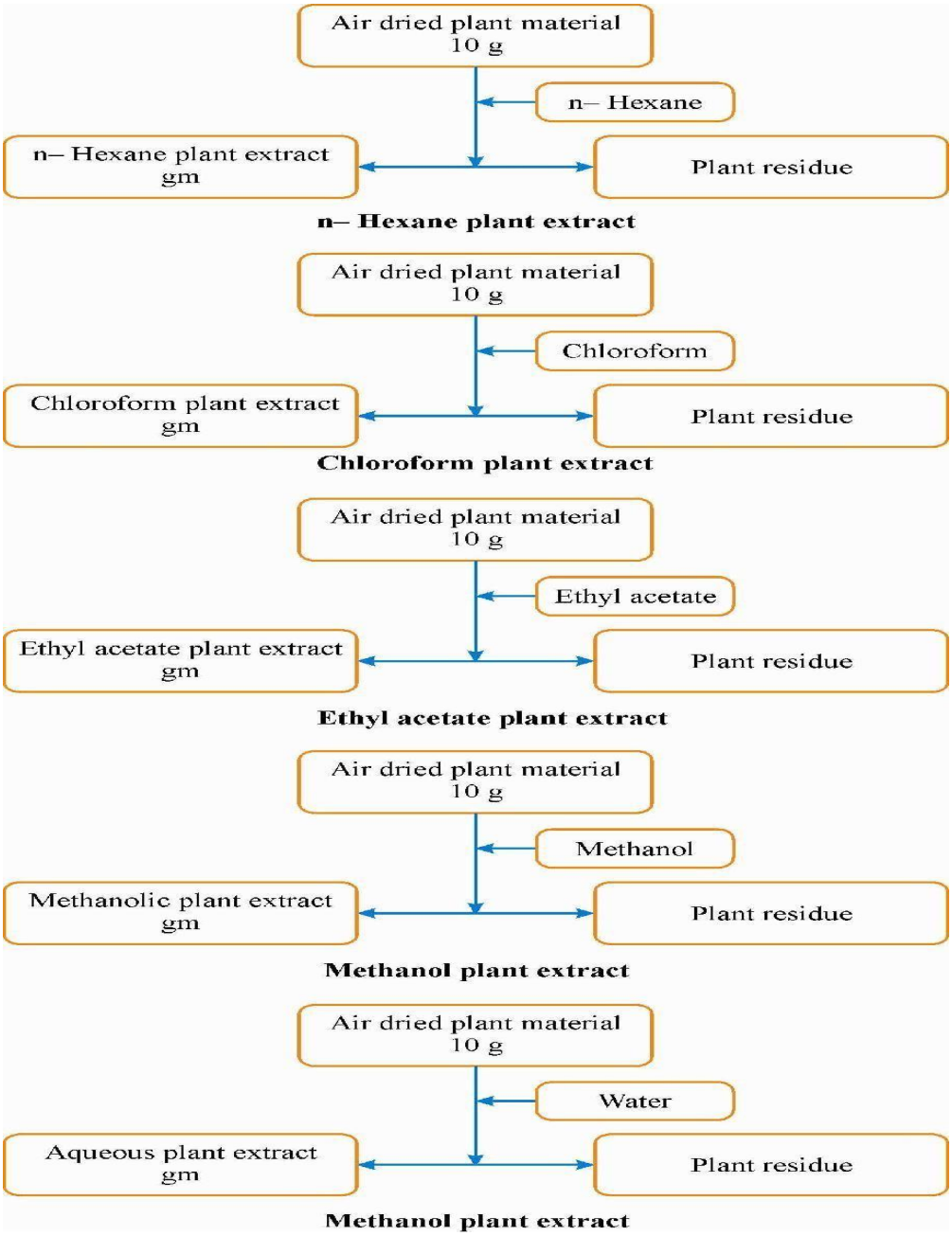

FIG. 1: Flow chart for preparation of plant extracts bysoxhlet extraction method temperature.

In order to obtain a sticky mass, moisture at ambient temperature was removed before the final yield.

SCREENING FOR BACTERIA EXAMINING ORGANISMS

The Mahatma Gandhi Medical College and Hospital in Jaipur, Rajasthan, India, provided the ATCC Bacterial strains and clinically isolated samples. Gram-positive Staphylococcus aureus 29213, Streptococcus pyogenes 19615, Enterococcus faecalis, 29212, Gram-negative Escherichia coli 25922, Pseudomonas aeruginosa 27853, Klebisella pneumoniae 70063, and Candida albicans ATCC 10231 bacterial strains were used for the investigation. To ensure their viability, all clinically separated samples were further maintained on nutrient medium.

Antibiotics utilised include Clindamycin, Ampicillin, Penicillin, Nalidixic Acid, Tobramycin, Ertapenem, Imipenem, Colistin, and Norfloxacin. On the necessary media, a few ATCC bacterial strains were kept alive. Gram-positive Staphylococcus aureus was kept on Blood agar medium, whereas Gram-negative Escherichia coli and Pseudomonas aeruginosa were maintained on Mac conkey. For additional research, all live hospital samples were revived on Nutrient agar media at 4°C.The study's media included Mac Conkey agar, blood agar, nutrient agar, and Mueller Hinton media.

RESULTS AND DISCUSSION

Herbs and herbal preparations have historically been utilised by the general people as well as traditional healers all over the world to treat a variety of illnesses since they are thought to be non-toxic, medicinal plants are those that include compounds that could be employed therapeutically or as building blocks for the production of effective pharmaceuticals. It has long been known that most poor nations employ traditional medicine and medicinal plants as a normative foundation for the preservation of good health. In light of this, two species of the Asteraceae family were chosen due to their widespread use in traditional and Ayurvedic medicine. Numerous earlier studies assessed the medical potential of the chosen plants, but because of their significant aesthetic value, they primarily concentrated on the flowers and essential oils. Because they are more plentiful and less expensive in nature, the present study placed more emphasis on their leaves, stems, and entire plant to analyse their pharmacological activity, making it more economically sound. Ageratum conyzoides was the plants selected for extraction, which was done using a Soxhlet extraction machine in five different solvents ranging from polar to non-polar.

% YIELD OF AGERATUM CONYZOIDES PLANT PARTS EXTRACTS USING SOXHLET EXTRACTION METHOD

Ageratum conyzoides was extracted, and the aqueous leaf extract produced the maximum yield (12.55%), while the n-hexane leaf stem extract produced the lowest yield (0.25%). Based on their dry weight in %, the results were collected in table 1.

TABLE 1: PERCENTAGE YIELD OF AGERATUM CONYZOIDES PLANT EXTRACTS IN VARIOUSSOLVENTS USING SOXHLET EXTRACTION METHOD

S. No	Solvents	ry weight of theextract(G)		% Yield %Yield=Dry Weight of the plant extract/mother solvent(dissolvedin 1:10 ratio) x100
1	n-hexane	A.C.L (S1)	0.070	0.70%
		A.C.S (S6)	0.025	0.25%
		A.C.W.P (S 11)	0.080	0.80%
2	Ethylacetate	A.C.L. (S2)	0.163	1.63%
		A.C.S (S7)	0.049	0.49%
		A.C.W.P (S12)	0.062	0.62%
3	Chloroform	A.C.L. (S 3)	0.255	2.55%
		A.C.S (S8)	0.064	0.64%
		A.C.W.P (S13)	0.257	2.57%
4	Methanol	A.C.L. (S4)	0.667	6.67%
		A.C.S (S9)	0.541	5.41%
		A.CW.P (S14)	0.386	3.86%
5	Water	A.C..L (S5)	1.255	12.55%
		A.C.S (S10)	0.28	2.8%
		A.C.W.P (S15)	0.983	9.83%

A.C.L.=Ageratum conyzoides leaf extract, A.C.S. = Ageratum conyzoides stem extract, Ageratum conyzoides Whole plant=A.C.W.P extract, S = sample

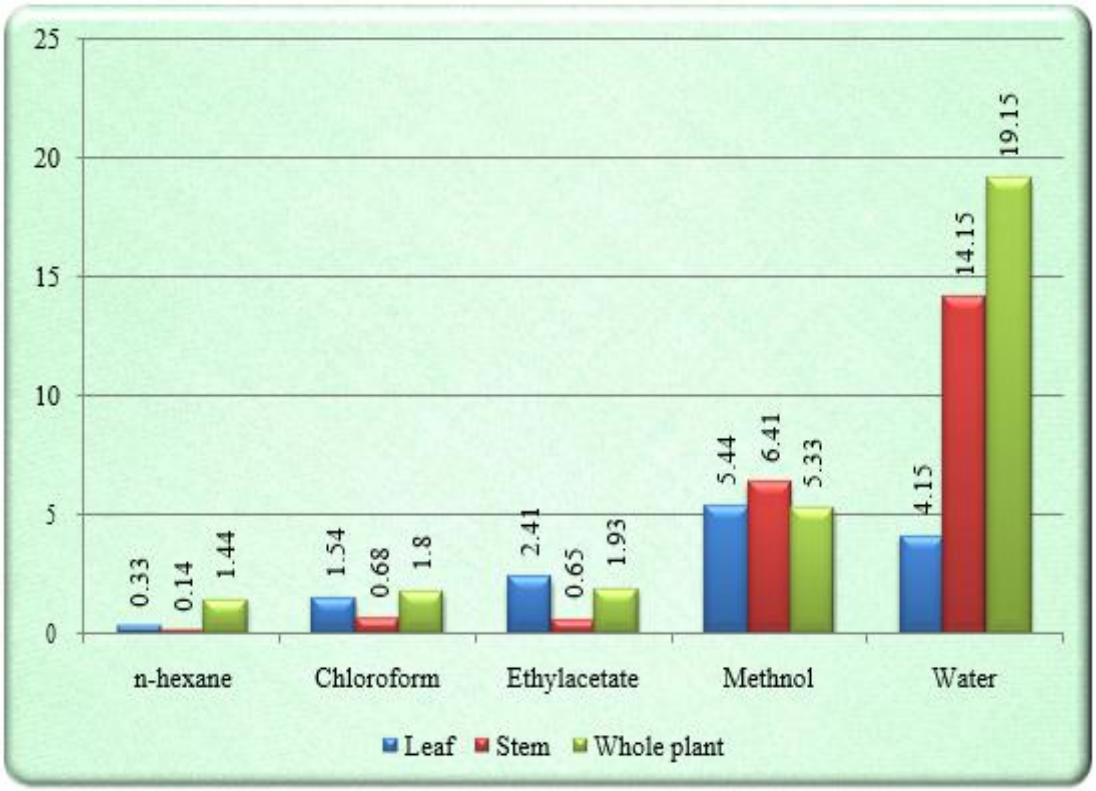

Figure 1: Graphical representation of yield of Ageratum conyzoides plant extract in various solvents by Soxhlet extraction method

CONCLUSION

In the course of their daily operations, plants produce a variety of secondary metabolites, and the phytochemical analysis of a single plant may change over time due to varying conditions for plant growth. Researchers from many fields are looking for cures for various illnesses. As old as humanity itself, the use of natural medicines to treat various illnesses. The relationship between man and natural medicines has a lengthy history, as evidenced by the texts mentioned, the preserved herbarium, and even actual plant medicines. The understanding of the use of medicinal plants is the result of many years of battles against diseases, which taught man to look for remedies in diverse plant components. Plants have long been of particular interest, and current understanding has recognised their active involvement in the availability of medications. This also confirms that ancient humans dating back to the Neanderthal Man consumed bioactive chemicals.

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Thus, the prevalence of bioactive metabolites derived from plants and their importance in medicine are undeniable. Scientists have become extremely enthusiastic and interested as a result, and there are now unheard-of potential in the fields of biotechnology and the quickly growing natural product businesses. Pharmacological screening of plant extracts followed by a bioassay-guided fraction that isolates pure components is one of the effective methods for the discovery of therapeutic compounds from higher plants. However, one of the obstacles of herbal products is standardisation before making it a commercially useable product in order to maintain a stable quality and therapeutic efficacy. In situations when the dosage is critical, poisonous plants with purported synergistic activity should definitely not be used. Care must be exercised with potent plants until the nature of the interaction is understood and extracts are standardised to incorporate what is known, albeit there is no use in discounting the wisdom of experience! It does place attention on the special characteristics of herbal remedies and can provide valuable lessons about how to efficiently and with few side effects treat disease.

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