

Review Article

Review: Medicinal plants ingredients, decoctions and therapeutic misuse

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Abstract

The Article highlights medicinal plants contain many compounds that have therapeutic importance for many pathological conditions, which are a popular medical inheritance for many peoples and the methods of extraction of those medicinal plants vary from water and alcoholic extraction to the distillation process and the article also dealt with the use of medicinal plant extracts and even the full use for the purpose of treatment, which must be under the hands of specialists in the field of doctors and pharmacists to prevent any symptoms that may harm the patient's life.

Keywords: : Medicinal plants ingredients, therapeutic misuse.

Introduction

The kingdom of plants is of great importance in life at the environmental level, as it is the lung of the Earth through its photosynthesis process, as well as being part of the food chain; it provides all organisms with food within the food chain, and it also has environmental importance in terms of the diversity of the ecosystem in terms of purifying the environment from some pollutants.

The chemical content of plants is considered a pharmacy for the treatment of many diseases throughout history, and with the development of technical sciences that accompanied the industrial revolution in the process of using medicinal plants, and obtaining the compounds inside them that have a pharmaceutical effect. [8];[22]

Components of the medicinal plant : One of the components of medicinal plants are compounds that are either carbohydrate, fatty, or volatile oils that will evaporate once exposed to air, so they are called volatile oils, and they have a smart smell, due to leaves such as mint and tree bark, including cinnamon, fruits, such as anise, and in flower crowns, for example, Jasmine Rose, and one of the qualities of volatile oils is that they do not dissolve as a food, most of them are saturated fatty acids, and they may be used for pharmaceutical purposes. Among its components are glucosides are glycosides crystalline compounds , Or amorphous has no color , but it has a very important effect in most medicinal plants for the treatment of pathological conditions, and it is found in the cellular juice in the gaps in thin plants, and it is found in most high-end plants, which are organic compounds decomposed by alcohol, or enzymatic decomposition, and the reaction product is a sugar part J consisting of a type of sugar, or more called Glycan and a non-sugar part called agliecon. It also contains" alkaloids, which are basic compounds that combine with acids to form salts, and their components include the element nitrogen and alkaloid compounds, morphine compounds and papaverine compounds with their narcotic effects.in the Cola plant, there is caffeine and it is found in the tea plant at 1% - 3% and in Cocoa about 0.07% - 0.36%. Other components are bitter bittersweet compounds, which are semi-alkaloids, and have a bitter taste that enter into use in opening appetite and improving digestion, mucilage's and mucolytic substances, which are carbohydrates, metabolic enzymes, possess protective and tonic effects against external infections and in internal use, for example gum Arabic, which is acacia trees, mucolytic substances in the family of marshmallow plants as Baker, and the leaves of the bulbous plant are called in the conductor fools . [5];[26]

Methods of extraction of components and extracts of medicinal plants for therapeutic purposes scientific research:

To ensure the effect of these plants in the treatment, the time of their collection must be taken into account, whether they are leaves, fruits or seeds, as there are certain times when the compounds are unrelated, or complex within a certain compound, and always prefer the time of sunrise, or sunset, it is known that the metabolic activity of the plant is at the peak of its reactions in the dark, and in the reactions of light when performing in the process of photosynthesis, after collecting and removing impurities, the natural drying process comes in the shade away from sunlight in order to prevent oxidation that may affect its chemical content, then comes the drying stage, and there is an industrial drying method using special furnaces that the temperature should exceed 33; to prevent damage to the material Effective in the plant . After drying, the plant is collected and ground to prepare for the extraction process.[23]

Extraction methods

First": aqueous extraction aqueous extraction:

One of the best aqueous methods is to use water as a solvent. in this method, a weight is taken from the dried plant powder in a ratio of 1:4 and crushed with cooling with a homogenizer and then left under cooling for 24 hours, then filtration is done with medical gauze to get rid of the precipitate, then filtration is done with filter paper number one, and a refrigerated central device may be used to obtain a fragrant solution free of impurities, after drying using a lyophilizer ,



Fig. 1: homogenizer-crushing device

[7] ,It is then extracted medicinal plants after drying the plant away from the sun for 15 days, after taking about 300 g of the plant, placed in water with a temperature of 70 C and using rotary evaporators, and then dried with a Lyophilizer as shown in Figure (1)

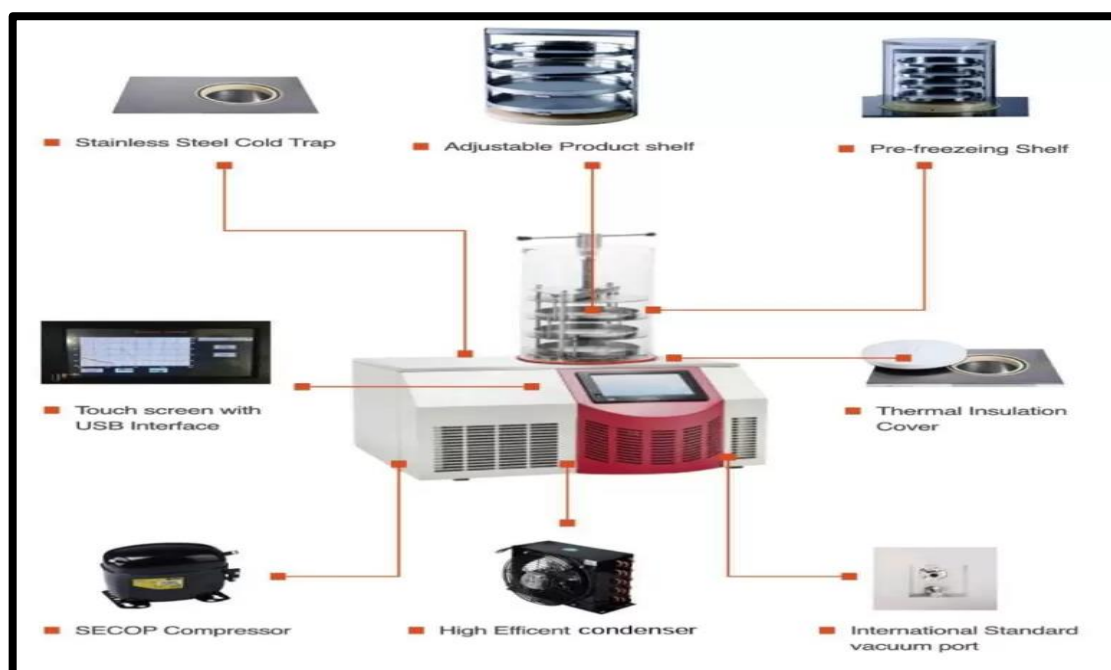


Fig. 1: devices for the purpose of diagnosing active substances in medicinal plants

Using the hot water method, cold water in a ratio of 1: 10 and placing the extract after adding sterile water in sterile vials and placing the extract in a Hazara incubator for 24 hours at 200 cycles per minute after which drying is used, the advantages of water extraction methods are easy, and low cost to use distilled water for extraction ,and their extracts contain:

First:

Tannins Anthocyanin Terpenoids Saponins however, there are disadvantages to aqueous extraction when the temperature of the extract is raised, it may cause damage to it, and the desired effect is not shown in biological tests .As well as the precipitate, which is annoying" in many plants in filtration through the number 1, or even in sterilization after drying, the center may be used to avoid that problem, but it must be refrigerated to avoid heat that causes damage to the extract.

Second:

"Alcoholic extraction : that is, the use of ethanol alcohol, as a solvent by the Harborne method (1973), where a weight is taken from the dried plant powder in a ratio of 1:4 crushing with a lyophilizer with refrigeration, then left under refrigeration for 24 hours, then filtered with cotton gauze, and then a rotary evaporator device is used, after which drying is carried out at Laboratory temperature, used for biological purposes, and the rest of the chemical tests[13].

Its extracts contain:

Tannins Terpenoids polyphenol Flavonoids Alkaloids

Another method of alcoholic extraction is the extraction of phenols with methanol, by mixing the powder of the plant with methanol (ethanol with water in a ratio of 1:1), after which the mixture is placed in a vibrating incubator 100 cycles /min with heat for 24 hours after filtration with filter papers, or under pressure using a funnel with pressure .A. Y,2021) Hussain(‘

[1] ; [15];[14];

Its extracts contain:

Tannins Terpenoids polyphenol Saponins Anthocyanin

Volatile oils Volatile oils

Oils in aromatic plants in their various organs, and by distillation varied depending on " the type of medicinal plant, and the organ containing the oils . Distillation is one

of the oldest and most famous ways to extract oils, because of its ease and low cost, as it takes a short time. In this method, the volume of water content, Steam is controlled without losing an amount of oil, or one of its components, and its distinctive qualities in terms of smart smell ,color

The method can be summarized as follows:

Water distillation water distillation:

This cover ends with a long tube known as the elbow, connected to the condenser unit, which is a thin tube with a length of 5 meters twisted inside cold water that changes continuously, then placed on the heat burner, and the tip of the tube is connected to the top of the cooling Basin, the other end is permeable near the bottom of the basin to the outside its production, which is collected in a special container, is called the separated oil collection container.[12]

1.Distillation using water and steam.

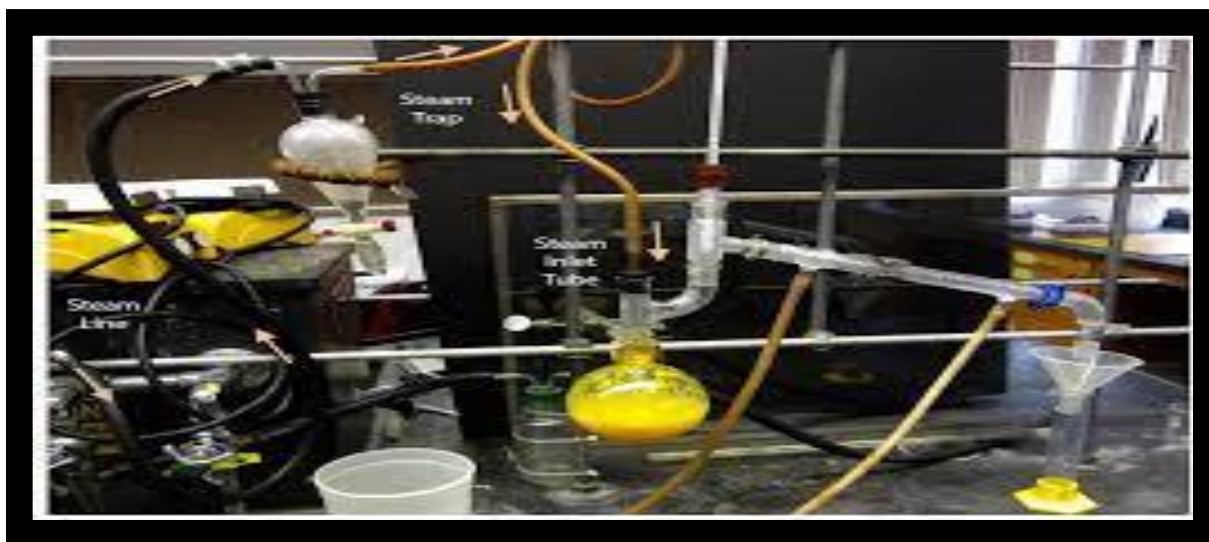


Fig 2: steam distillation device

The container has a mesh basket inside which the plant material is inside. So that there is no contact between the plant material, and the surface of the water inside the pot. When you start heating and boiling, the water vapor rises to the top through the plant parts located inside the mesh basket, and the oil comes out in the form of gas and goes through the condenser cooling devices . [16]

The most important feature of this method is the lack of loss of essential oil of high quality and the plant parts are the target of the separation process to obtain its essential oil, such as clove leaves, eucalyptus plant, and the seeds of each fennel plant, which is locally

called"(khaznayig), star anise, cumin and dill. These are some of the trade routes.

2. Steam distillation steam Distillation:

It is used by means of a vessel containing a mesh basket without water, and it is connected to the outside of its base by a pipe installed with a steam generating device (boiler) using the heat source resulting from the combustion of the fuel used, and the amount of steam is controlled by a valve with knowledge of the steam pressure with a special measuring device for that, and the amount of oil is good and with good specifications naturally" and chemically" and from plants in which basil, sage and thyme are used in this way. This method is economical, fast and easy to implement, Figure (2) shows the steam distillation device.

3. Water distillation of pilot oil water distillation for volatile oil

In order to prepare for the distillation process, the plants are immersed directly into the distillation vessel. Then the heating is done with an electric or gas heater, and this method depends on taking plants that have the ability to boil, and they must be partially dried, and the percentage of oil is high, for example, cloves, taking into account that the boiling temperature does not reach 100 degrees Celsius, which is the boiling point of water, which does not exceed the pressure. This method has disadvantages; the amount of oil produced is relatively small" and takes a long time, as well as the possibility that the oil carries the smell of burning during production due to the presence of plant parts under the heating pot.

4. Distillation of volatile oils with water and steam Distillation of volatile oils with water and steam:

In this method, the plant is placed inside a perforated strainer in a pot, and the water is at a lower level of the plant parts under distillation, and with heating, water vapor rises permeating the plant parts, carrying the pilot oil with it, the condenser arrives, and the water vapor and the pilot plant oil are converted from its gaseous state to liquid, then it is collected in decanters, the oil is separated, placed in opaque bottles, then placed in the refrigerator, and from the plants that use this method to separate the volatile oils are grains, leaves and woody stems .

5. Method of Direct steam volatile oil distillation method of Direct steam volatile oil distillation

This method of distillation consists of mesh trays, after which Steam is generated towards those trays in a heating vessel separate from the device used for the purpose of distillation. Steam rushes through a tube into the distillation device. in this method , many parts of plants such as seeds, leaves (soft and not soft), flowers and wooden stems are distilled, and the distillation devices are equipped with valves through which the vapor pressure is controlled, and then the temperature is raised. . .The advantage of this method is that the plant material does not burn, or the components

of the pilot oil crash. This method is used to extract peppermint and lemon grass vegetable oil.

6. Floral setting floral setting:

In this method, the flowers are placed on glass plates, then distributed accurately with a weight between 0.75 - 1 kg of natural flowers, and the plates are placed for a period of up to two days or more, at room temperature, and then the extracted flowers are raised with oil, and replaced with new ones when they are not good, or suffer wilting, provided that they are large in size to increase the strength of their smell, and this process is repeated for up to 48 hours until the weight of the extracted flowers of oil for one glass frame reaches 3 to 3.5 K, and then the oil loaded with oil, and replaced with a new fat,, and it is called aromatic fat.

7. Dissolution and extraction Dissolving and extraction:

Here, absolute alcohol with a concentration of 95% is added to the scented fat (1 to 2), and it is shaken well on the cold, the goal is to dissolve the vegetable oil (essential with solvent), and they are put together" under cooling in the refrigerator under for a period of about 24 hours, after which the mixture is filtered for the purpose of obtaining an essential oil dissolved in alcohol, and the filter is distilled under pressure using a compressor, and at a temperature not exceeding 35°m above the water bath, the precipitate of essential oil is called free oil .

8. Spray extraction spray extraction :

It is done by pushing the hot air stream on the fresh flowers containing the essential oil in a gaseous state with hot air drawn each of them to the other chamber, which is saturated with the previous animal fat in the form of a molten liquid, and the flowing product is in the form of a dense spray, which in turn is saturated with the essential oil in a gaseous form for easy absorption and followed by the withdrawal of scented fat.

9. Extraction by infusion process extraction by infusion process:

In this method, flowers are soaked with vegetable oils, such as sunflower oil ,and soybean oil, as they are placed in copper pots covered with zinc and covered until they become homogeneous, then they are transferred to a centrifuge, and the essential oil is withdrawn under cooling with a good shaking with the use of alcohol in the clouds, and the Scientific is repeated several times, then the alcohol containing the essential oil is collected, and it is distilled at a temperature of 30 Celsius, and inevitably" the remaining precipitate is the crude essential oil.

10. Volatile solvent method volatile solvent method:

This method is used in hexane alcohol and petroleum ether, and it is characterized by Ease, low cost, and therefore it is widely used commercially and is summarized by the following steps:

First": infusion method of soaking :

By the soaking method, the flowers are immersed in solvents in a ratio of (2 to 1), and placed in special Iron-made containers, galvanized inside, and the immersion process takes about 8 to 10 hours at room temperature, and these methods are called cold soaking, or placed for 4 to 5 hours at a high temperature of about 30 to 35 Celsius and also called the hot soaking process . The solvent extracts are then withdrawn and the regeneration is carried out a second time with a return of three hours, and the regeneration is carried out again . After that, the extracts are collected, and they are mixed with anhydrous sodium sulfate to remove the water present with the extract with rapid shaking, and they are filtered and the filter diameter is at a temperature of no more than 35 Celsius inside the water bath, and the precipitate after the filtration process is a raw essential oil in the form of a paste, after which 100% absolute alcohol is added at a ratio of 8 alcohol to one of the extract; to remove the waxy, fatty residues from mixing, and placed for 10 to 15 hours in the refrigerator at a temperature below zero Celsius . After that, the filtration is carried out at a temperature not exceeding 30 degrees Celsius above a water bath to get rid of those waxy and fatty substances, and the remaining after filtration is crude oil .
W.H.O

II": extraction via circular motion cylinder via extraction via circular motion cylinder

In this method, a device is used that is a double-walled cylinder that passes warm water inside it carried on a stand installed in a concrete base, and has a scale that is a thermometer and an avometer, and has an upper hole for entering samples, and another for entering the solvent, and inside it is a strainer divided into four parts that rotate around the middle axis in the cylinder a hole from the side, from which the strainer is pulled after the end of the extraction process; in order to get rid of plant residues, it is equipped with a filter located below the cylinder to filter the solvent from the plant parts, and the cylinder is operated by hand on the axis of rotation or by engine [21]



Fig 3: distillation device under vacuum to separate oils

Study of the biological effect of these plant extracts Study of the biological effect of these plant extracts

1. Influence in microbiology :

Bacteria and yeasts, as the effect of these bacterial extracts is studied in a similar way to the allergy test method, by preparing a standard solution, the concentration is fixed, then tablets are prepared from filter papers No. 1, added to an amputation dish and bacteria are grown and the diameters of the effect in these bacteria and yeasts[20]

2. The method of mixing a standard solution of plant extract at a concentration determined with the culture medium is carried out, and the diameters of the effect are determined by measuring them after a week

3. The extract is added after the preparation of the concentrate from the standard solution to the culture medium ,[25]

Human Impact Study of the impact on humans

The study of the effect of plant extracts on humans may be extremely dangerous in the absence of reference to international protocols, as there are plants that may contain compounds with high toxic effects, and therefore the toxicity of any plant extract should be determined by conducting half of the lethal concentration LD50 and conducted on laboratory animals and then determine whether it has an effect or not .[19]

The conclusion is that the use of a medicinal plant as a treatment for humans was previously "in pre-industrial times subject to the folk heritage based on the proven effect and often" the treatment was based on the medicinal plant in that same country

,and that 80% of the world's population uses plants as a treatment, although there are about 150,000 species containing highly toxic substances to public health .[17]

There are many accidents that have occurred due to the use of medicinal plants due to their contents of chemical compounds . Studies have shown that many plants used for the purpose of treatment contain lead and cadmium exceeding the permissible limit, as well as that some dietary supplements of algal Origin also" contain compounds dangerous to consumer health and heavy metals such as lead. The danger of using medicinal plants for the purpose of treatment lies in the source from which they were collected, they may be grown or planted near streets or factories, or they were watered with contaminated water .

Also, the use of plants for the purpose of treatment requires a deep understanding of the kinetics of drugs inside the body and the correlation of their active complexes with the places of influence and receptors in cells, which inevitably interfere with the use of plant extracts that may pose a danger to consumer health and backfire.[2]; [3]

The danger of using medicinal plants is more for pregnant women ,and the danger may be due to the lack of knowledge of determining the required dosage , and good preparation ,[18],

the World Health Organization has been interested in the interference of absorption of drugs, medicinal plants, absorption the Caco-2 cell absorption model was used to study, such as flaxseed, rapeseed, Pine, berries and herbs, laxatives anthrax, and plant extracts affect the absorption of drugs, ,[11] [6].

Some pharmacological interventions of plant extracts may cause an increase in blood pressure and blood sugar level due to the lack of knowledge of most workers in the field of perfumery , the pharmacokinetics of the drug, its interferences in the human body, and their belief in absolute safe use and have no harm, a study by Researchers has proved the importance of garlic in the treatment of hypertension, but the mechanisms of antiplatelet effects of garlic. disulfide and dilly disulfide inhibit the synthesis of thromboxane..58, 73, possibly by inhibiting phospholipase-A and arachidonic acid mobilization and negatively affect" the work of platelets [4]

It is becoming increasingly difficult to administer treatment in medicinal plants and government health surveillance in poorer countries" with less health care compared to the developed world as well as a lack of health awareness among poor people .

Medicinal plants have great benefits for many organic conditions and diseases, and the Arab-Islamic Medical heritage and the Chinese and Indian heritage are full of therapeutic plants for diseases, but the progress of Pharmacology, pharmacotherapeutics and medical science, which coincided with industrial progress, many drugs are of plant origin or were used for certain therapeutic conditions .

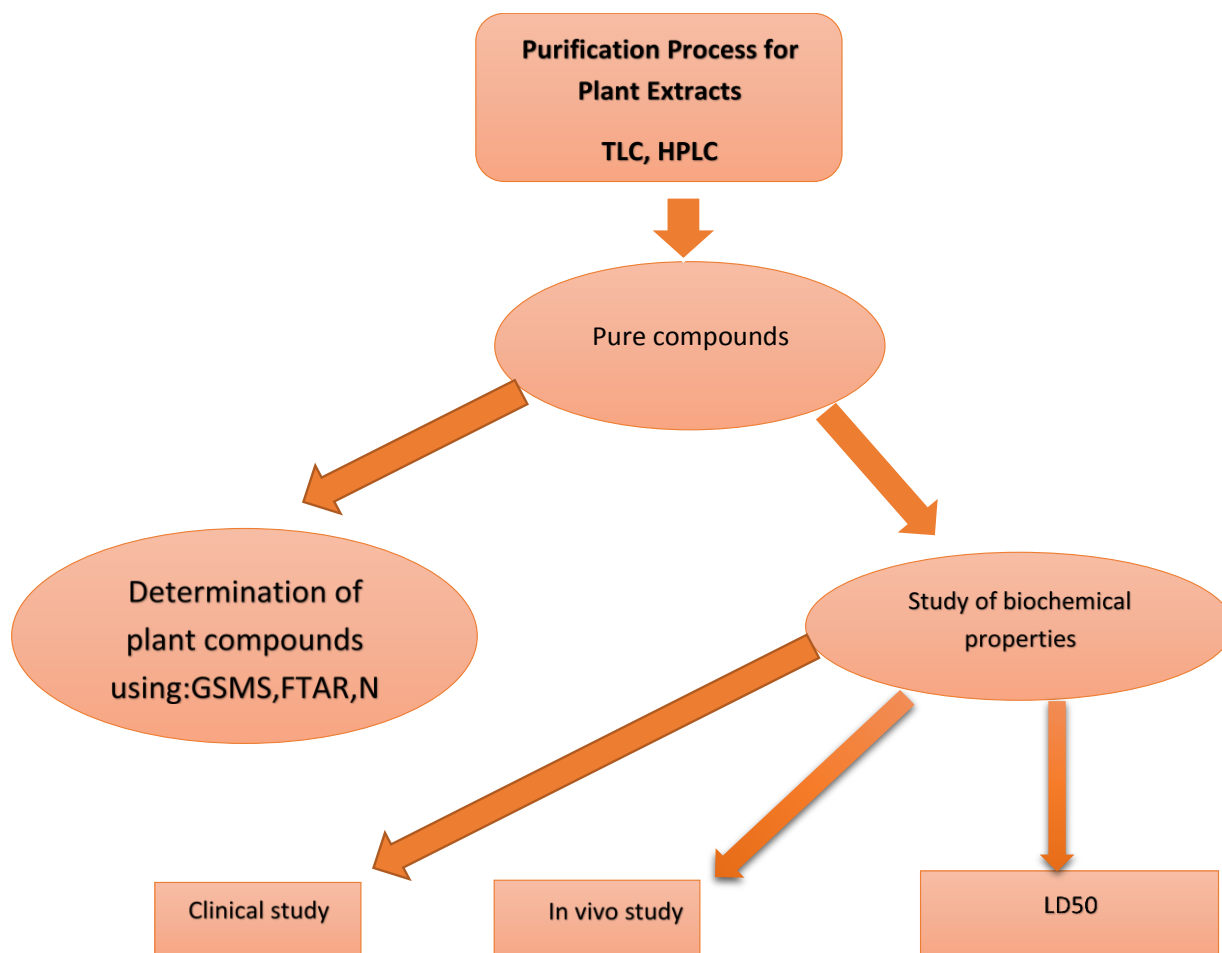


Diagram. 1: the correct way to handle medicinal plants after extraction

The method of dealing with medicinal plants as a treatment must go through stages, as described in diagram. (1), which is to obtain the plant extract, then the purification process, identify the active substances, determine their toxicity, and then conduct a clinical study to determine their therapeutic effect, which has a therapeutic effect.

Therefore, medicinal plants have a chemical content that was mentioned at the beginning of the article varies by species, and genera until they became described as pharmaceutical, and the methods of their extraction vary, and the goal is from aqueous to alcoholic to distillation, and after obtaining pure plant extracts, even raw, the study of all scientific aspects of pharmacokinetics and side effects answers their therapeutic intervention, and the body's sensitivity to them that may occur inside the body after taking those extracts, and any drug should determine its toxicity by

studying half of the lethal concentration L50 on experimental animals , Therefore, treatment with medicinal plants should be under the medical supervision of a pharmacist, or a doctor; being the only one who holds a legal professional status to maintain the patient's health .[18];[24]

Conclusions:

The medicinal plant is of therapeutic importance due to its chemical content, however, it should be exclusively under medical care" to maintain patient safety

Recommendations:

Prevent the use of medicinal plants for the purpose of treatment except under medical supervision, especially if the patient is taking a treatment schedule for a specific medical condition or suffers from chronic diseases, establish a course of medicinal plants to educate people on their proper use.

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المستخلص

تسلط المقالة الضوء على النباتات الطبية التي تحتوي على العديد من المركبات التي لها أهمية علاجية لكثير من الحالات المرضية وهي مورث شعبي طبي لكثير من الشعوب وتختلف طرق الاستخلاص لتلك النباتات الطبية من الاستخلاص المائي والكحولي الى عملية التقطير وكما تناولت المقالة استخدام خلاصات النبات الطبي وحتى استخدام كامل لغرض العلاج والذي يجب ان يكون تحت ايداي مختصة في المجال من أطباء وصيادلة لمنع أي اعراض قد تلحق الضرر بحياة المريض