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Investigation of the effect of antibacterial properties of Eryngium caeruleum M.B. On pathogenesis microorganisms: A review study

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Abstract

Introduction: Today, medicinal plants are used to improve the function of the physiological system of the body and health and medicinal plants have been used as food and medicine to treat or prevent diseases. With the development of new chemical drugs and various antibiotics, the harmful effects of these drugs appeared. The aim of this study was to investigate the effect of antibacterial properties of Eryngium caeruleum M.B. It is on the pathogenesis of microorganisms Methods: This review study was conducted in 2021 by searching for keywords such as antibacterial family, Eryngium caeruleum M.B and pathogenic factors in valid databases Results: Based on various studies, the results show that the alcoholic extract of portulaca oleracea has a greater antibacterial effect than the aqueous extract of portulaca oleracea. This plant is more or less moisture-resistant as a weed on the roadsides and slopes. It grows in the plains of Gorgan, Mazandaran, Gilan, Azerbaijan, Lorestan, Khuzestan, Khorasan and Tehran provinces. , Sucrose sugar and Eryngium caeruleum M.B. Essential oil with a pleasant smell is about 88% Conclusion: The diameter of growth inhibition zone in both alcoholic and aqueous extracts was related to chloramphenicol, erythromycin and ampicillin, respectively, and the lowest inhibitory concentration was related to Staphylococcus aureus.

Keywords: antibacterial properties , Eryngium caeruleum M.B. and pathogenic factors

Introduction

Eryngium caeruleum M.B. With the scientific name of Eryngium caeruleum M.B. As a biennial plant, unburned, stem up to 180 cm tall, round, at the base 3.5-2.5 mm thick, in the lower part brownish-ocher, above the leafy green-green, grooved , Branched from the base, with long, branched branches. Leaves linear, shoulder-shaped, with legs without legs, ovate, serrated-saw-toothed, often with deep or lobed incisions, about 5 mm long and wide; The lower and middle leaves of the stem are small petioles with slightly reduced incisions, with petioles 2-3 mm long, the upper ones are reduced to pods. Leaves 4-5, linear-bayonet, very sharp, 2-3 mm long, at the base with white edges. Umbrellas have a radius of 3-4, unequal, some reduced and some 10-15 mm long. In terms of global distribution of this plant in areas such as: Turkey, Caucasus, Central Asia, Afghanistan and Pakistan. Armenia, Talesh and northern Iran [1] In terms of consumption and application aspects of this plant is less used in traditional medicine due to being prickly. This species is known as a fragrant vegetable with the local name of Eryngium caeruleum M.B. For the people of the northern provinces of Iran, and it is used to prepare green salt (in: the local name of Gilani spice or seasoning, which is prepared from fragrant vegetables such as, Eryngium caeruleum M.B. Chouchaq and salt. To be used. Its young leaves are very fragrant and fragrant, but it has no place in traditional Iranian medicine and is unknown to people in other parts of the world. The most important factor in ensuring the quality of herbal medicine is the correct choice of the plant used. This constitution can be broken by fraud in commercial plant products or by uninformed individuals who collect medicinal plants from nature. Also, according to studies, the toxic effects of this plant indicate that the existence of fraud in medicinal plants is unlikely or remains unknown, although there are reports in the official literature about the adverse effects of medicinal plants due to their replacement with species. Other or contamination with poisonous plants is recorded. All parts of the plant are six-horned, diuretic and laxative, and increase appetite and open women's menstruation. [2] And because of its folic acid, it is hematopoietic, eating its root increases appetite and lust, and is an antidote to toxins, and its decoction is a painkiller for side pain. Drinking a decoction of six horns with sugar is a windbreaker and is useful for eliminating bloating and side pain. Urine increases milk and sweat and eliminates kidney and bladder stones and is beneficial for heartburn. Its fresh root jam is also a fragrance for the stomach. Hexagonal root extract opens menstruation. Hexagonal root poultice with barley flour and chicory leaves softens hard swellings. The nature of the raw medicine is the primary factor in choosing the extraction method. Some drugs are not easily percolated. Because in this process, the drugs must be crushed into a fine powder and uniformly pressed into the percolator. Some other drugs, although easily compressible in the percolator, may not be able to easily release their active ingredients into the solvent through which they pass, making them much easier to extract by massaging. Is [3 [

The percolation process requires more skill than the massage process and is also more expensive due to the need for special equipment and the operator's time. Often a combination of massage and percolation is used to extract a raw drug. The drug is first soaked to soften plant tissues and dissolve most of the active ingredients, and then the percolation process is performed to separate the extract from the pulp (marc) [۴]

The aim of this study was to evaluate the effect of antibacterial properties of Eryngium caeruleum M.B. It is on the pathogenesis of microorganisms

Methods: This review study was conducted in 2021 by searching for keywords such as antibacterial properties , Eryngium caeruleum M.B. and pathogenic factors in valid databases such as: pub med and google scholar

Results Discussion

Based on this study to evaluate the antibacterial properties of Eryngium caeruleum M.B. Pathogenesis on microorganisms. Today, herbs are used for healing and health. Throughout history, herbs have been used as food and medicine to treat or prevent disease. Some of them are used in nutrition and others in industry and treatment of diseases, but if useful plants with healing flowers, roots and leaves are used, many of them will remain unused. They will wither after flowering, and therefore we will lose the great wealth that nature

has given us every year without anyone knowing about it, and also if nature makes good use of these gifts. Their use also prevents the import of similar plant products. [10]

In this age, with all the extent that chemical drugs have created in the treatment of diseases, but because some of them, in addition to their beneficial effects, also lead to side effects, many people use herbs, compounds and today Many books and public magazines talk about the use of herbs, but their harms are more or less mentioned, and this has made most people consider this plant harmless, while the reality says otherwise and The fact is that medicinal plants can be as harmful and effective as they can be harmful, and some even contain a deadly toxin. The Persian name is "six horns". In Gilan it is called Chuchak or Anarchochaq. In Arabic it is "Qarsana Masdas". Apparently some call it a widow. In traditional Iranian medicine, many medicinal thorns, which number more than ten species, are called pomegranates, but when fully used, it means the same aromatic plant. [19]

General tips on collecting the plant:

- The plant should not be planted because the amount of active substance changes.
- The full growth of the plant should be selected to identify and determine its scientific name. Is.

Collect flowers during or before pollination.

- Flowering leaves and branches should be collected at the time of flowering and before the fruits and seeds ripen.

Collect roots and rhizomes in the fall after the end of plant activities.

Avoid picking plants infected with fungi or other pests. It is also necessary to choose the day of collection, for example, do not collect immediately after rain or sampling when the plant withers [20, 21] In general, the preparation of the extract is based on extraction and the active ingredients by a solvent Appropriate. Solvents are usually: ethyl alcohol with different degrees of alcohol, water, etria mixture of them, solvents used for extraction in commercial quantities, ethylene dichloride, dichloroethyl ether is isopropyl ether. The advantage of these compounds over other solvents is that they can be used without fear of chemical modification and decomposition of metal containers. In addition, these solvents are resistant to oxidation and hydrolysis. [22-25] In order to obtain a high concentration of active ingredients in the extract, the extract must be evaporated and concentrated at a suitable temperature that does not cause the decomposition of the active ingredients of the drug and low pressure. Here it is necessary to mention the essential oils which are a kind of plant extract and plant extracts used in cosmetics. The increasing use of plant extracts in cosmetics has opened a new chapter that requires special skills because the plant extracts used in these products must have special properties that are slightly different from the extracts used in medicines. In this case, the plants should be controlled for their characteristics and contamination with insecticides. After identifying the plant, laboratory extraction is performed to determine the quality of the plant. Propylene glycol or butylene glycol (DL alkanes) is widely used in cosmetics. Solvents can be vegetable oils (sometimes mineral oils). The function of the solvent is to separate the active ingredients of the drug or other soluble substances. Although there is a clear relationship between the amount of plant used and the concentration of active ingredients in the final extract, since the extraction conditions play a very important role in the quality of the final extract, the final product must be carefully adjusted and tested. [26, 27] Using alcohol, propylene glycol, butylene glycol, water, or a mixture of these solvents, water-soluble substances such as biophenolic components, tannins, vitamins, terpenes, and amino acids can be combined with oily solvents. Carotenoids, essential fatty acids can be extracted. Of course, when the solvent is saturated with solutes, there is a limit to all extractions.

Experience has shown that for 200 grams of dried plants, one kilogram of solvent is suitable, in a ratio of 5: 1. Extracts with less than this solvent should be used with caution. In fact, what is important for designing a drug formulation is the ability to evaluate the amount of active ingredients, although there are some limitations that can be used in this evaluation. [28] Evaluation of plant extracts The extract should be clean, free of foreign particles, without turbidity and sediment (even after long-term storage). The color of the extract should be appropriate for the plant and its ingredients, for example red for carrot carotenoids, blue for spirulina copper derivatives and so on. If all the extracts are the same brown color, one reason could be oxidation due to spoilage or polymerization of sugar derivatives, which of course indicates that the extraction method is incorrect. However, it should be noted that the dark brown color that many extracts have naturally is not always a sign of poor quality. The smell of the extract should be similar to the smell

of the plant. For example, if chamomile extract does not smell like chamomile flowers, it may not have been extracted properly. However, glycolic extracts, especially hydroglycolic, are not aromatic enough to replace the aromatic substances in the product. [29] The first recommendation for the smell of the extract is to use the most basic laboratory diagnostic equipment, namely the nose and eyes. Despite the fact that extracts containing suitable preservatives at certain concentrations retain their original properties, bacteriological tests are important tests. If we can not have a completely sterile product (which is often the case with natural products), but per gram of extract should not contain more than a hundred non-pathogenic bacteria. Bacteria can be counted by direct injection into a specific culture medium or filtration on 0.2 filters and then inserting a filter into the culture medium. [30] Determination of dry residue is usually used as a method to evaluate the quality of the extract (if a large amount of plant is used to make the extract, it should have more dry residue), but the dry residue is actually a soluble part or extractable part. . It is a plant that varies according to the constituent chemicals in each plant. Typically, the maximum extractable portion of a dried plant is 10 to 20%, meaning that a plant extract prepared in a ratio of 20 to 100 can not contain more than 4% of the remaining dry matter. Decomposition of the extracts shows that the dry residue of glycolic extracts is obtained from 20% of the dried plant. It is between 1 and 3.5%. All other cases, more or less, must be examined by supplementary experimental methods. These tests should be performed to check that the dry residue contains active ingredients. Or it just contains preservatives, salts or added sugars that should be checked using ultraviolet light. Determination of the refractive index can confirm the results obtained for the dry residue. The greater the amount of dry residue in the solution, the greater the rate of deterioration. The final refractive index also depends on the nature of the solvent, for example the refractive index of propylene glycol on water.

Extracting solvent In drug extraction, the solvent or mixture of solvents, menstruation, and the rest of the drug that has been drained of the active ingredient is called a brand. Although water, alcohol, and to a lesser extent glycerin are the most widely used extraction solvents, acetic acid and organic solvents such as ether and its derivatives such as dichloroethyl ether and diisopropyl ether may also be used to extract certain materials. Process. [31] Due to its ease of availability, low cost, and suitable water-soluble effect, this solvent is used in the extraction of many plant materials, especially in combination with other solvents, but in any case water is rarely used as a solvent. Becomes. Because most plant active ingredients are complex organic compounds that are less soluble in water than alcohol. Water dissolves sugars, gums, starch, tannins and pigments well, but most of these substances are not components of the extraction process. Water also extracts substances that, if the extract stays in place for a while, creates an undesirable deposit, and finally, if the extract does not contain preservatives, it will be a very good environment for the growth of molds, yeasts and bacteria. Therefore, if water is used as a solvent alone, it is often added to the final product of alcohol to prevent the growth of microorganisms. Hydroalcoholic mixtures are the most widely used extraction solvent with solvent effects. They contain water and alcohol, prevent microbial contamination and prevent the deposition of extractive materials during inertia. Because alcohol alone is more expensive than hydroalcoholic mixtures, it is used as a solvent only when necessary. [32] Glycerin is sometimes used as a solvent (Cosolvent) in combination with water or alcohol. Glycerin prevents the deposition of inert substances at rest and is especially useful to prevent the deposition of taffeta and their oxidation products. Glycerin also has a protective and antimicrobial effect and can help stabilize the medicinal extract. [33]

Conclusions

The study of the diameter of the growth inhibition zone of infectious microorganisms under the influence of antibiotics and different treatments of Eryngium caeruleum M.B. Extract shows that the highest amount of growth inhibition zone in both alcoholic and aqueous extracts was related to chloramphenicol antibiotics. The diameter of the growth inhibition zone has been decreasing under the influence of different treatments of both aqueous and alcoholic extracts by decreasing the percentage of the extract.

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