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The role of phytopharmaceuticals and reactive oxygen species (ROS) in cancer therapy

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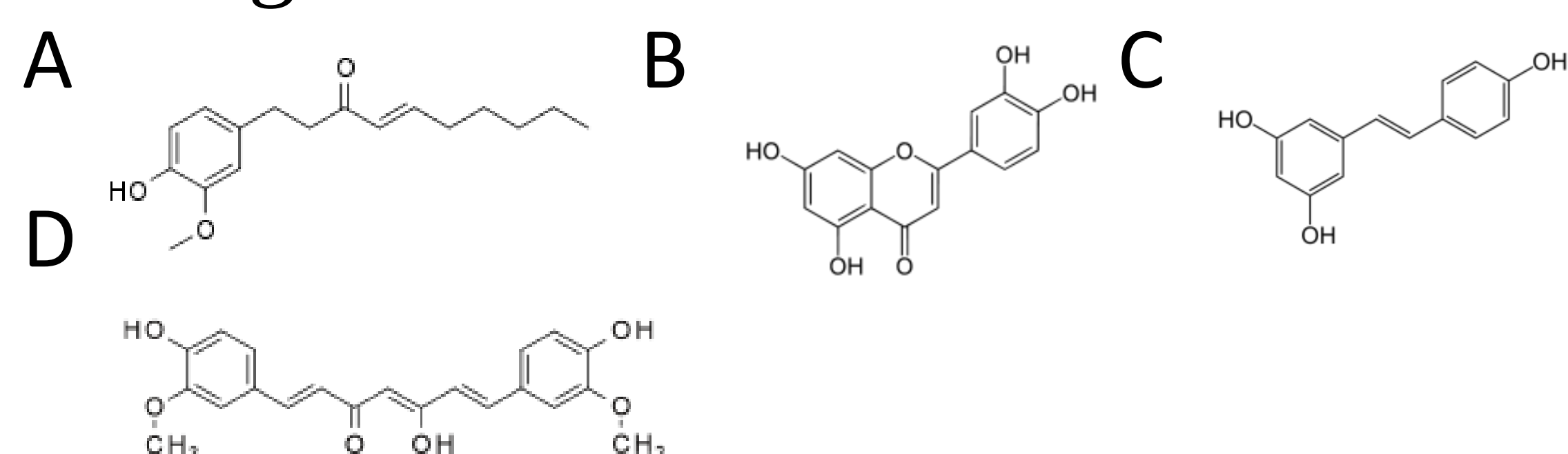


Statement of Problem

Phytochemicals are widely used in combination with chemotherapy drugs in order to reduce their diverse side effects. Increased cytotoxic levels of ROS induce different signaling pathways contributing to cell cycle arrest and cell death. Phytochemicals may destroy cancer cells by possibly generating intracellular ROS.

Research Purpose

The aim of this study was to introduce several phytopharmaceuticals which may be potentially considered in cancer therapy by inducing ROS in the malignant cells.



Chemical structure of four phytopharmaceuticals; (A) 6-shogaol; (B) Luteolin; (C) Resveratrol; (D). Curcumin

Results and Conclusion

6-Shogaol, a ginger plant derivative, induces p53 activation in leukemic cells, leading to apoptosis and cell-cycle arrest. Luteolin may restrain the proliferation and expression of p-STAT3, p-EGFR, p-Akt, and p-Erk1/2 in breast cancer cells. Resveratrol, a dietary phytophenol, generates ROS and ER stress in melanoma. then accelerate apoptosis by inhibiting Bcl-2 and upregulating Bax. Curcumin, a food flavoring phenolic compound enhances ROS by inducing JNK and ERK1/2 pathways and potentiates p53-mediated apoptosis in choriocarcinoma cells. **The present study may help selecting new cancer therapeutic strategies by using plant medicines as herbal supplements in cancer treatment.**

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Investigating the therapeutic properties And nutritional value of spirulina

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STATEMENT OF PROBLEM

Spirulina refers to the dried biomass of *Arthrospira platensis*, an oxygenic photosynthetic Cyanobacteria found worldwide in fresh and marine waters. This alga represents an important staple diet in humans and has been used as a source of protein and vitamin supplement in humans without any significant side-effects. Many toxicological studies have proven Spirulina's safety. It has a long history of use as food and it has been reported that it has been used during the Aztec civilization. Spirulina contains functional compounds, such as phenolics, phycocyanins, and polysaccharides, with antioxidant, anti-inflammatory, and immunostimulating effects.

RESEARCH PURPOSE

The aims of this review are to summarize the mechanisms of action, highlight the potential effects of this alga in humans and address current and possible future clinical applications

RESEARCH METHOD

We systematically searched online databases including: PubMed-Medline, Embase, ISI Web of Science and Cochrane Central Register of Controlled Trials. Two independent authors extracted data and assessed the quality of included articles



RESULTS AND CONCLUSION

In the present studies, the benefits of using spirulina and its effect on the treatment of diseases were investigated. Some of its potential uses include: 1. Immune system support: Spirulina contains antioxidants and anti-inflammatory compounds that may help boost the immune system. 2. Allergy relief: Some studies suggest that spirulina may help reduce symptoms of allergic rhinitis, such as nasal congestion and itching. 3. Blood sugar control: Spirulina may help improve insulin sensitivity and lower blood sugar levels, making it potentially useful for people with diabetes. 4. Lowering cholesterol: Spirulina may help reduce levels of LDL (bad) cholesterol and triglycerides, while increasing levels of HDL (good) cholesterol. 5. Anti-cancer effects: Some preliminary studies suggest that spirulina may have anti-cancer properties, although more research is needed in this area. 6. Muscle recovery: Spirulina contains high levels of protein and amino acids, which may help promote muscle growth and recovery after exercise. 7. Detoxification: Spirulina may help remove heavy metals and other toxins from the body, potentially reducing the risk of certain health problems. Overall, spirulina shows promise as a natural supplement with a variety of potential health benefits. However, more research is needed to fully understand its effects and determine optimal dosages for different uses. As with any supplement, it's important to speak with a healthcare provider before starting to take spirulina.

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The therapeutic role of Gingerenone A as a herbal supplement in cancer and various diseases

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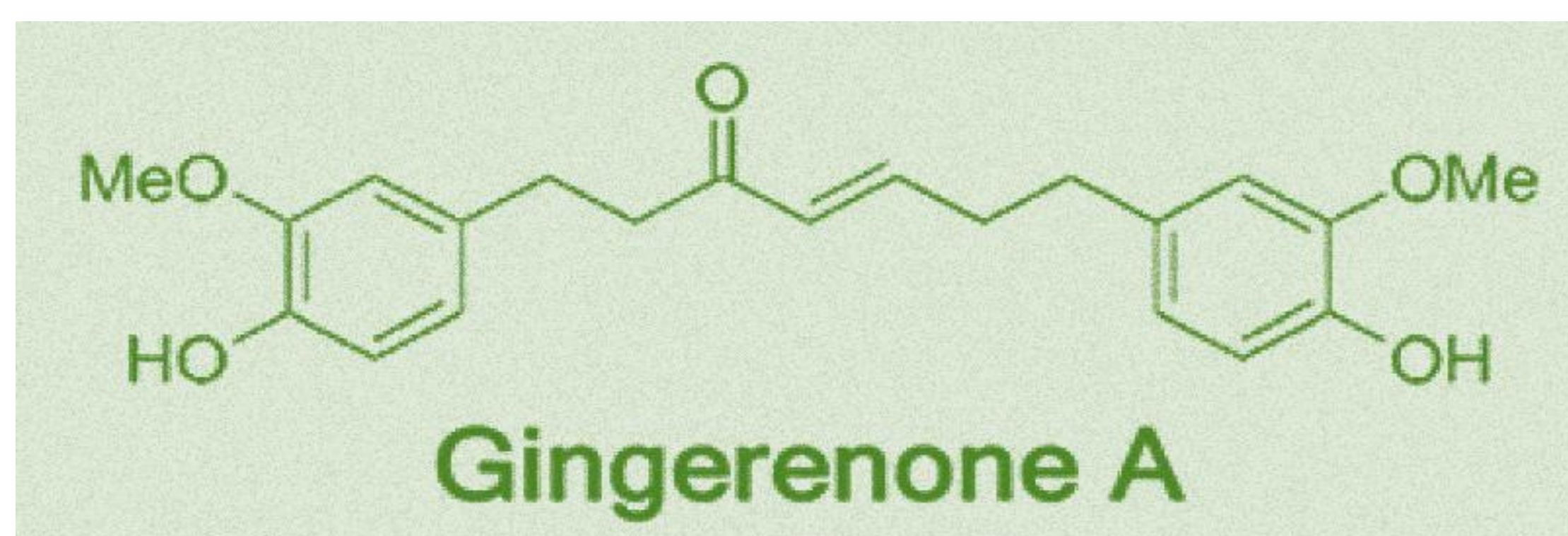


Statement of Problem

Long-term or intermittent use of chemical drugs can lead to side effects such as drug resistance. In contrast, herbal medicines are gaining popularity due to their potential to combat drug resistance without causing significant side effects. Gingerenone A (GA) is a known bioactive derivative of ginger root which may mimic or even amplify some of the therapeutic characteristics of ginger in clinic.

Research Purpose

The aim of this research is to collect information on the biological properties of GA and its possible therapeutic effects in various diseases.



Chemical structure of gingeranone A. Gingeranone A has a linear diarylheptanoid structure and has phenolic and ketone functional groups.

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Results and Conclusion

GA shows strong and selective toxicity towards certain types of cancer cells. Moreover, this derivative destroys senescent cells with high preference, giving it a therapeutic property for diseases with high accumulation of aging cells. Alternatively, GA may be used for the treatment of obesity through suppressing adipose expansion and inflammation. GA may exert its antibacterial and antiviral properties by inhibiting ATP synthase and JAK2, respectively. Intriguingly, GA is introduced as an anti-COVID phyto drug by its high affinity binding to 3CLpro and preventing its activity. **In conclusion, this study confirms the therapeutic and anticancer value of GA and its beneficial supplementary use in treating cancer and multiple diseases.**





An overview of the benefits of royal jelly in veterinary medicine

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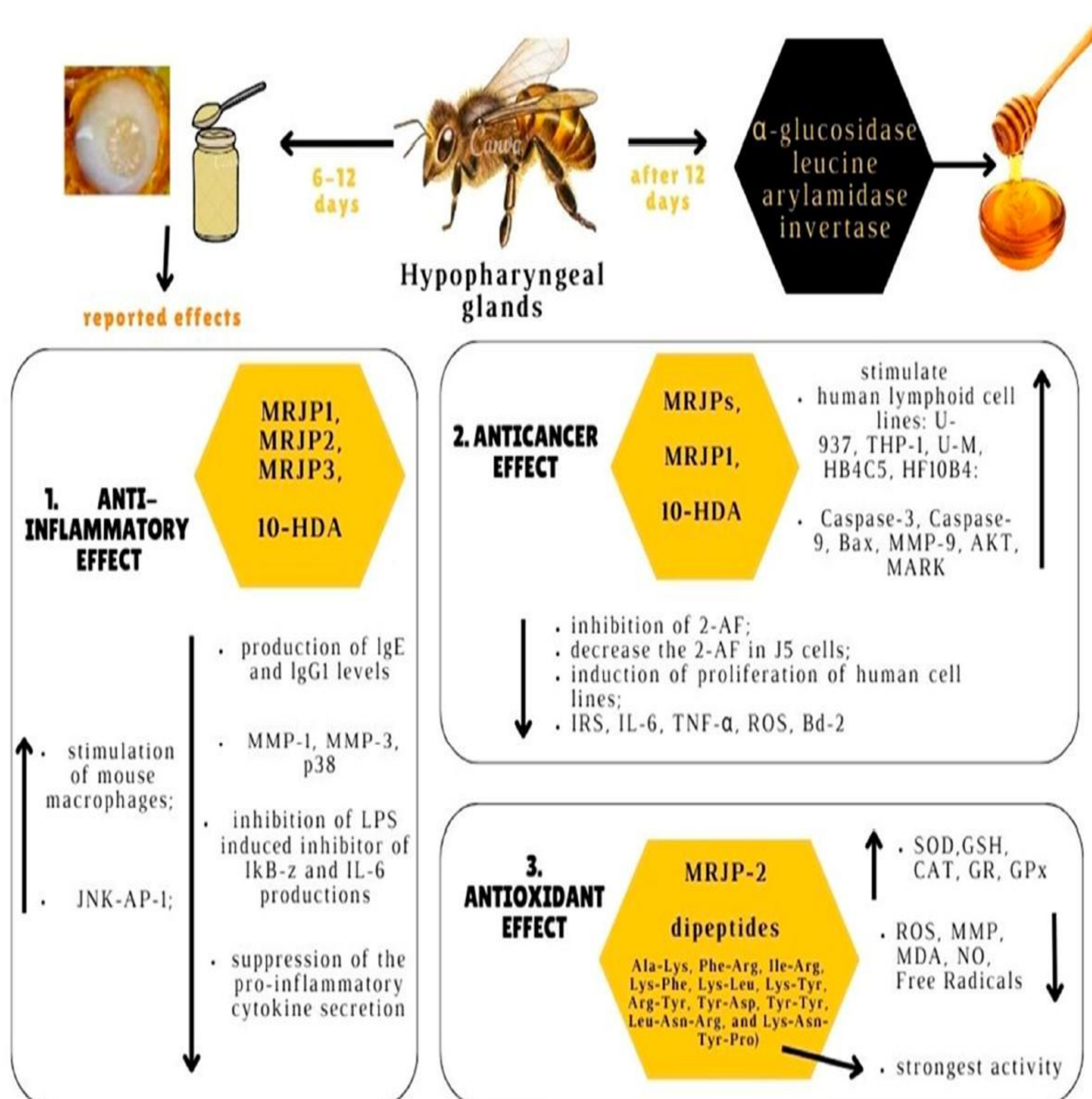
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Royal jelly (RJ) has long been one of the most commonly used natural products in medicine. RJ is secreted from worker bees' hypopharyngeal and mandibular glands, serving as a food source for the queen bee and larval growth. This product shows an astonishing complexity in terms of composition, including carbohydrates, lipids, proteins, polyphenols, hormones and vitamins. Many biological and remedial properties are considered for RJ, including neurotrophic, antioxidant, antidiabetic, antihypercholesterolemic, hepatoprotective, antibiotic, antitumor, anti-inflammatory, immunomodulatory, antiallergic and antiaging activities. It is also a blood pressure regulator and antiseptic. This review highlights the various benefits of RJ as an alternative medicine agent in animal health and welfare. Although considerable research has been done on RJ, much remains to be learned about its biology and biochemistry, as well as its application in modern veterinary medicine.

✓ Proximate composition of fresh RJ

Compound	Levels [mg/100 g]
Vitamin A	1.10
Vitamin B1	2.06
Vitamin B2	2.77
Niacin (B3)	42.42
Vitamin B5	52.80
Vitamin B6	11.90
Vitamin B9	0.40
Vitamin B12	0.15
Vitamin C	2.00
Vitamin D	0.2
Vitamin E	5.00
Ca	22.8–24.0
P	338.4–412.1
K	321.1–357.4



✓ Proximate composition of fresh RJ

Compound	%
Valine	1.6
Glycine	3.0
Isoleucine	1.6
Leucine	3.0
Proline	3.9
Threonine	2.0
Serine	2.9
Methionine	3.7
Phenylalanine	0.5
Aspartic acid	2.8
Glutamic acid	8.3
Tyrosine	4.9
Lysine	2.9
Arginine	3.3
Tryptophan	3.4

✓ Anticancer, anti-inflammatory, and antioxidant effects of RJ and their mechanisms.

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An Overview of The Probiotic Industry in Iran

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Abstract:

Modifying the lifestyle is the best and most important way to increase improve the quality of life in people. A proper diet is an important part of a healthy lifestyle. Therefore, studies to achieve a suitable dietary guideline have always been of interest, but due to individual, cultural and geographical differences in different regions of the world, it will not be possible to implement a common guideline for all people. Based on this, it is very important to find new ways to produce healthy and nutritious foods that can be effective on people's health in addition to providing energy. Currently, 4 large companies producing probiotics are active in Iran. most common commercial strains produced by them include Lactobacilli and Bifidobacteria, some species of Bacillus and yeast. These strains are produced as single or multi-strain products and in the form of products such as food additives and starters, medicinal supplements (different ages, special products for women), additives for products Cosmetics (types of gels, cosmetics), livestock and poultry supplements, supplements suitable for horses and pets (such as ornamental birds, cats and dogs), sports and non-sports supplements, they are Available in, capsule, drops and powder form.

Considering the growing market of probiotic products, creating the necessary infrastructure to produce diverse products can be a profitable investment for countries active in this field, such as Iran.

Keywords : Probiotic industry, Food Supplements, Beneficial Food Combinations

Probiotic industry in Iran:

Probiotic industry in Iran In our country, the production of probiotic supplements has been started for more than 2 decades. Before 2010, all probiotic products were Varadeti, and in 2008, the first company producing probiotic products started working, and thus the probiotic industry was officially launched in Iran. became. Currently, there are 4 large companies that produce probiotic active ingredients. In general, the number of factories producing probiotic products in the country is 85 units, and these factories have received production licenses for the production of 163 probiotic products. The volume of production of probiotic products in 3 fields: human, livestock, poultry and aquatic is about 450 tons per year. This amount will cover more than 50% of the domestic needs, this amount will provide almost 70% of the needs of the country's dairy industry, currently it will cause more than 20 million dollars of foreign currency to leave the country. Unfortunately, with all the efforts made in the country, the annual growth of the probiotic market in Iran from 2009 to 2014 was negative 54%, which is due to various reasons, including the lack of awareness and support, supervision and scientific and strategic planning, which requires solutions. Suitable for removing obstacles to be presented and implemented quickly.

Microorganisms widely used and commercialized in this field:

Types of *Lactobacillus* (*acidophilus*, *casei*, *fermentum*, *gasseri*, *johnsonii*, *reuteri*, *paracasei*, *plantarum*, *rhamnosus* and *salivarius*) and *Bifidobacterium* (*animalis*, *bifidum*, *brave* and *longum*) and *Bacillus* (*Bacillus subtilis*, *Licheniformis*, *Coagulans* and *Yeast* (*Saccharomyces cerevisiae*) and *Boulardi*) belong. These strains are produced as single or multi-strain products and the final product or additive compounds. in the form of additives and starters to food ingredients, pharmaceutical supplements (general and specific), additives to cosmetics and health products, additives in the diet of livestock and poultry, aquatic animals, bees, nutritional supplements suitable for horses and pets, supplements Sports and non-sports nutrition.

Regulatory rules and safety considerations

general, depending on the type of product and the target society, the regulatory laws for production and consumption will be different. The drug organization, the veterinary organization with the help of the standard organization are active as legislative and regulatory sources in the production of probiotic supplements in Iran. So far, 15 standards have been developed for a number of probiotic products, and standards are being developed for the rest of the products. The side effects of probiotics are usually minor in a few cases, which mainly include people who have severe disease or immunodeficiency, the use of probiotics in these people is not recommended.

Conclusions: Conducting more and more detailed investigations both in the field of identifying new sources of isolation of microorganisms and checking the quality and effectiveness of the produced products and the absence of side effects in the long-term use of these supplements in different hosts should be required to show their safety and limitations. The development and updating of probiotic production lines and related industries such as quality control equipment, packaging and maintenance are among the infrastructures required for this industry. The production of low-quality products will be prevented, while increasing the quality will provide a chance to enter and achieve a significant share of the world markets for the activists in this field.

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Investigating the therapeutic and healing effects of tragacanth

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Introduction

Biopolymers due to their different properties and bioactivity effects have been used in the various industries. One of the most important polysaccharides with great therapeutic potential is Tragacanth, which is a complex, heterogeneous and anionic carbohydrate that is released spontaneously or by scratching on the gummifer plant. This polysaccharide has many medicinal uses for the treatment due to excellent physical, chemical and biological properties. Also, in traditional Iranian medicine, Tragacanth is used as a painkiller. In this review, the therapeutic and healing effects of Tragacanth are investigated in the medical and pharmaceutical field.



Figure 1. Gum Tragacanth & gummifer

Results

In the present study, the benefits of Tragacanth and its effect in the treatment of diseases were investigated. In general, this natural polysaccharide is used for diarrhea and constipation. Tragacanth is effective in wound regeneration and healing due to its ability to bind to fibroblast. also, Tragacanth has the ability to control drug releases from drug delivery systems. This natural polysaccharide has also shown good results in drug encapsulation.



Figure 2. Gum tragacanth is now being applied for a broad range of applications, from drug delivery strategies to hard and soft tissue engineering.

Method

Related studies published in Google Scholar and Web of Science sites were searched and reviewed. Studies were reviewed in which only the uses and properties of katira were reported. Finally, the results were analyzed using the required software.

Conclusion

Tragacanth is one of the wonderful substances that has very wide applications in the field of medicine and health and treatment.

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Isolation and identification of lytic bacteriophage against *Streptococcus mutans* isolated from dental caries plaque

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Statement of Problem: Dental caries is a common infectious inflammatory disease worldwide caused by the colonization of many bacteria, especially *Streptococcus mutans*. Increasing resistance of oral pathogens to antibiotics has led to the use of alternative methods to overcome microbial resistance. Bacteriophages are an effective tool to deal with microbial agents.

Research Purpose: The aim of this study was isolated and identified lytic bacteriophage against *Streptococcus mutans* isolated from people with dental caries and determined of biological characteristics.

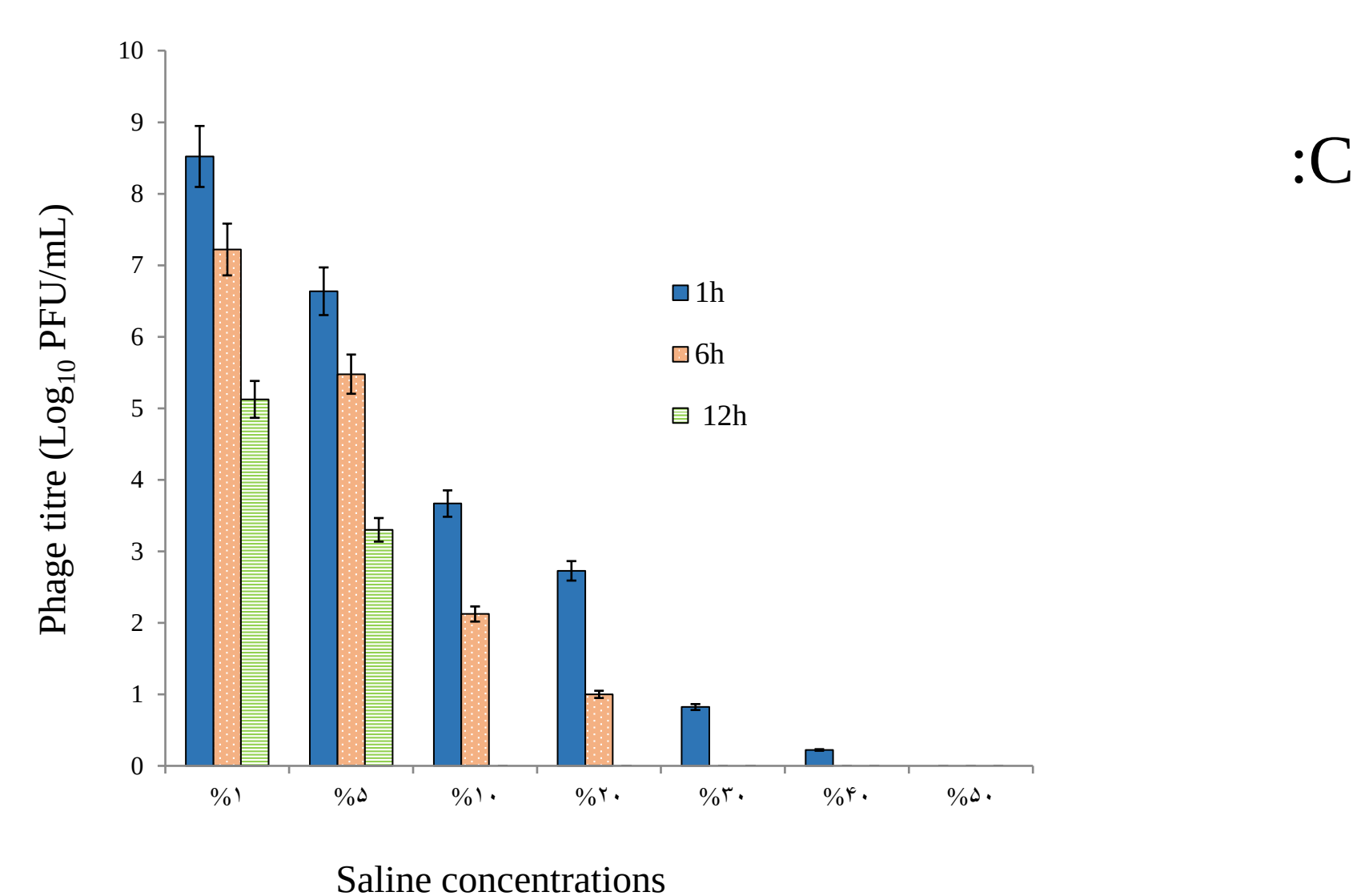
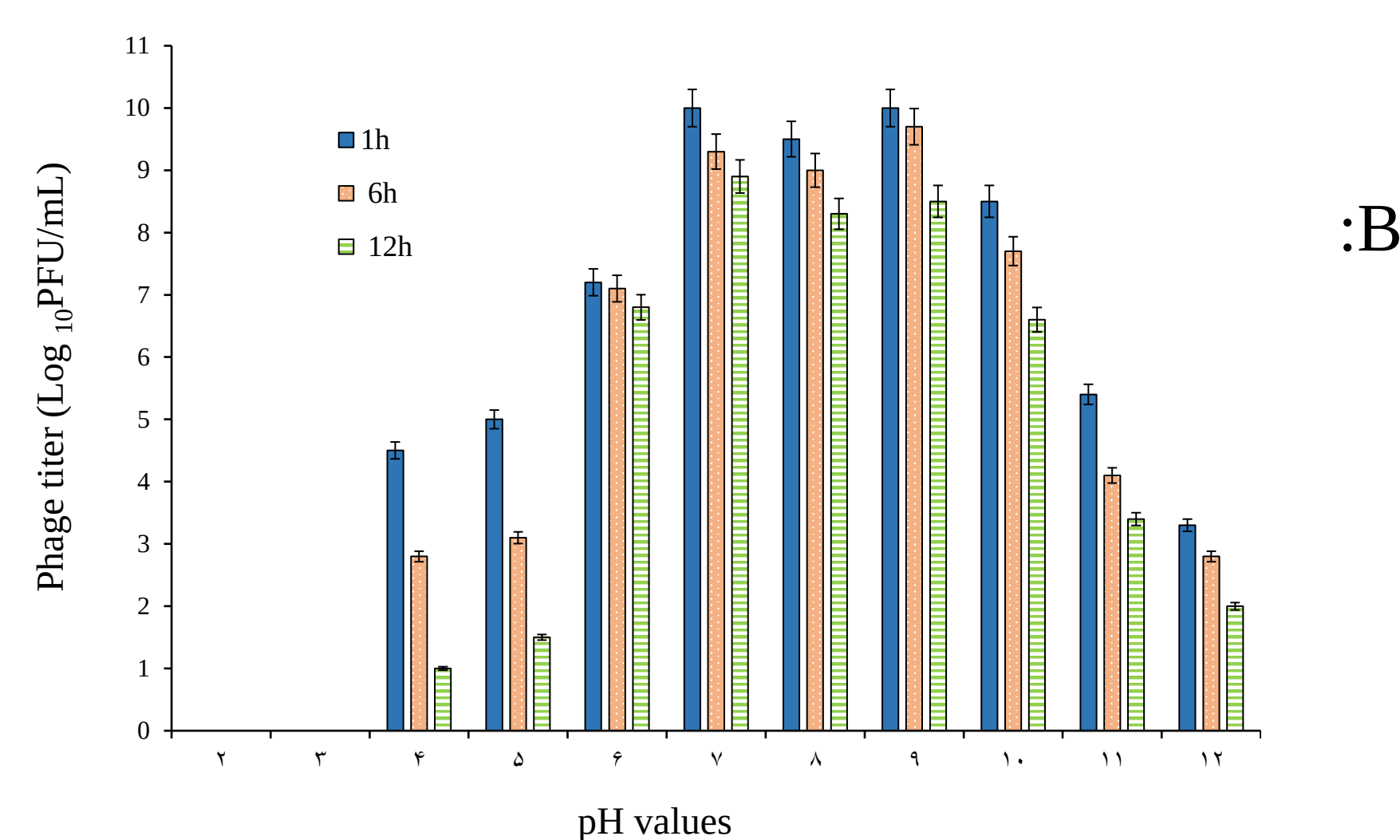
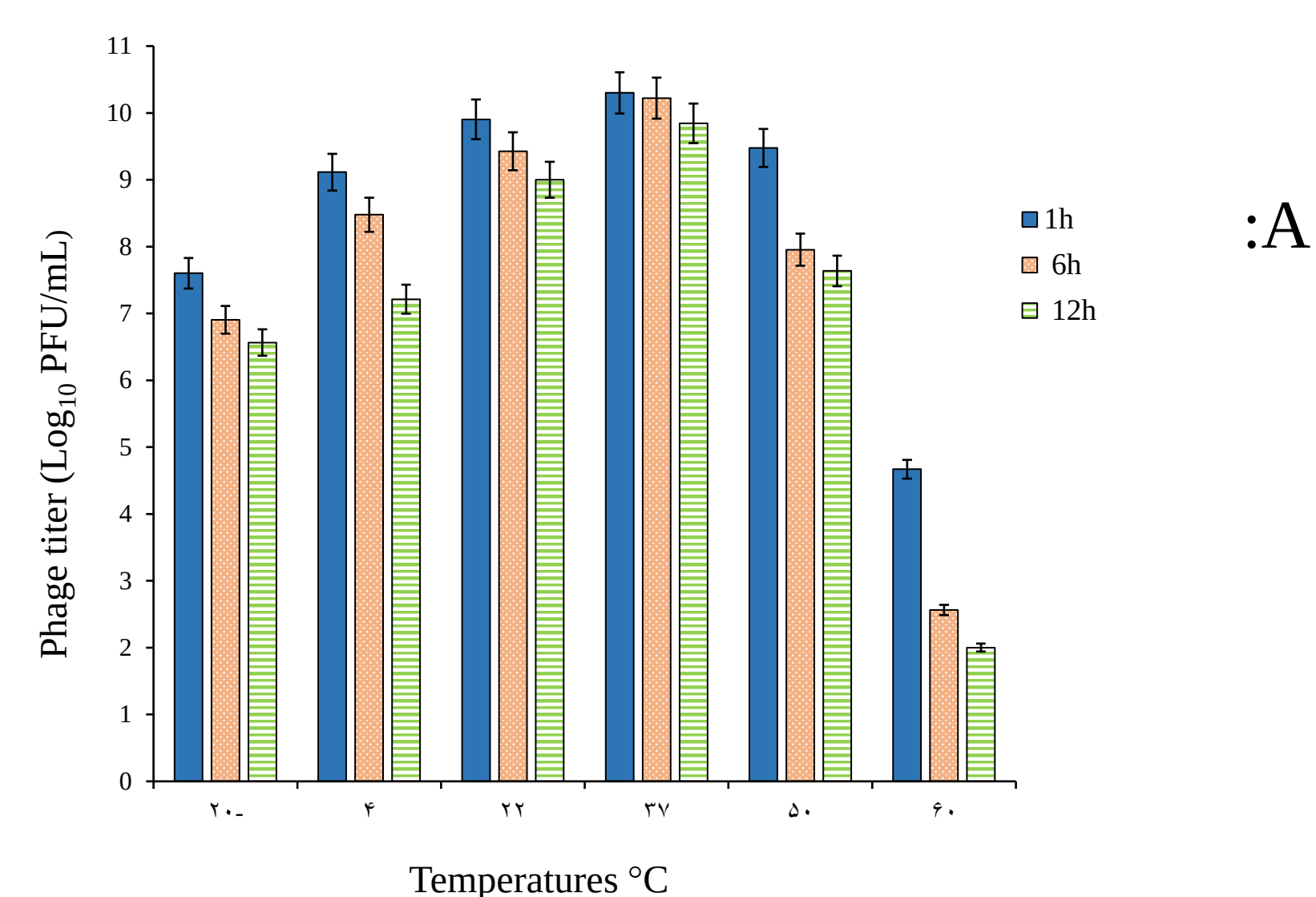
Research Method: In this study, dental plaque samples were collected for the isolated of *Streptococcus mutans* and cultivated in Mitis Salivarius agar medium. Suspected *Streptococcus mutans* isolates were confirmed by biochemical tests and PCR. A lytic bacteriophage against *Streptococcus mutans* was isolated from Isfahan city urban wastewater. The effects of temperature, pH values, NaCl concentrations and host range were investigated on the bacteriophage. The bacteriophage stability was evaluated at 37, 22 and 4 °C for 1 month. Data were analyzed by GraphPad Prism version 8.0 software (GraphPad Software Inc., USA) using one-way analysis of variance (ANOVA).

Results and Conclusion: The bacteriophage was able to kill 80% of *Streptococcus mutans* isolated and stabled in an almost wide range of temperature (-20–50°C), pH values (6-10), and NaCl concentrations (1-10%). Also, the bacteriophage was resistance to the mentioned temperatures for 1 month.

Based on the physiological properties investigated, the bacteriophage can be used as a suitable choice for genomic studies in preparation for commercialization in the direction of phage therapy.

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A: Stability of the phage at different temperatures (– 20 to 70 °C).
B: Stability of the phage at different pH values (2–12)
C: Stability of the phage at different saline concentrations (1–50%).
D: Plaques of the phage on the lawn of *Streptococcus mutans*.
(The results are presented as the mean ± SD. Error bars indicate the standard deviation)



Microbial and Chemical Properties of *Mahyaveh*, a traditional Iranian fish sauce, and optimization of production conditions to decrease microbial load Review

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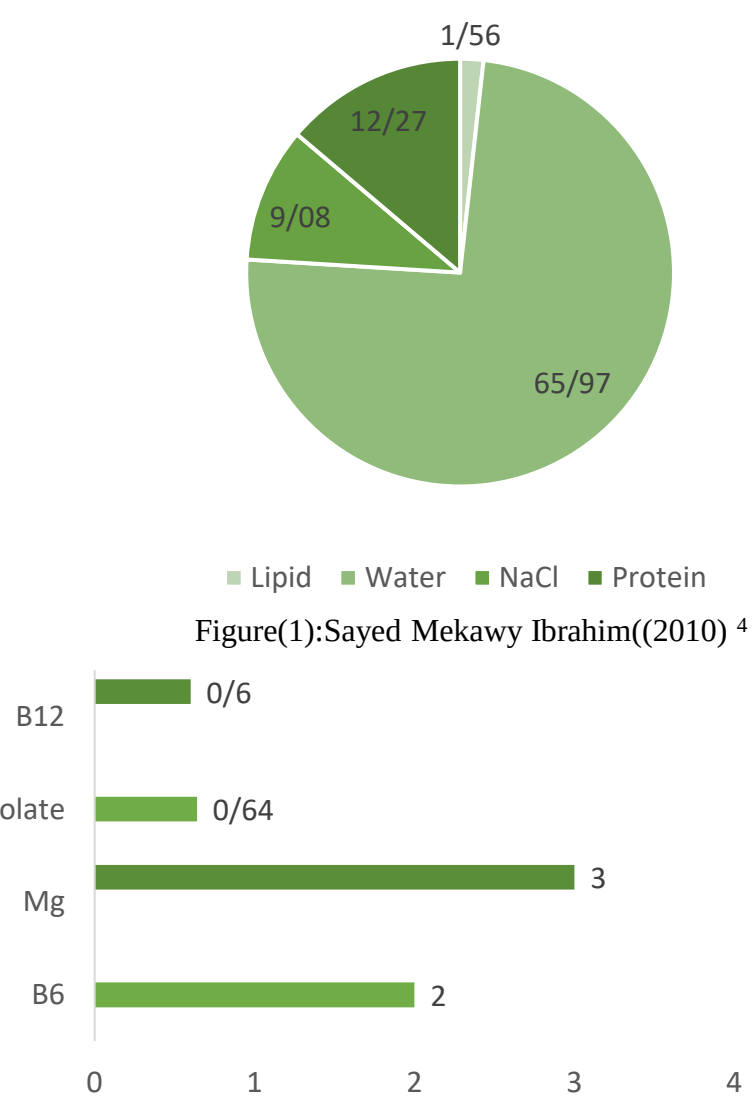
Abstract

Mahyaveh is a traditional fermented Iranian fish sauce. The taste, smell, preservation time and healthiness of *Mahyaveh* are affected by its microbiota. According to these populations, this fermented sauce can be one of the foodborne diseases sources; to overcome this problem and have healthier *Mahyaveh*, some research was done and stated. Here some articles are presented; the aims of these studies¹⁻² were measuring the microbiota and some chemical conditions of *Mahyaveh*, detecting and counting pathogens to compare with standards, and also figuring out the best condition of production to produce safe and healthier *Mahyaveh* with low microbiota, and prevent possible foodborne diseases and spoilages. Factors such as the type of the fish(tuna, anchovy and sardine), the salt concentration (15%, 25% and 35%), and the fermentation time(30, 75 and 120 days) affect the microbiota; 15 treatments were designed in a project according to the Box-Behnken Response Surface Methodology to find out the optimum condition of production of *Mahyaveh* to decrease the microbiota. Mesophilic acidophilic bacteria, *Coagulase Positive Staphylococci*, mould, yeast¹, *Lactic acid bacteria*, *Micrococcus*, *Enterobacteriaceae*, and *Bacillus* were counted², the PH of the samples was measured and compared with Food and Agriculture Organization (FAO) standards¹. The optimum condition was obtained at the time of 103.63 days of fermentation with Sardine fish and at a salt concentration of 29.38%². The maximum number of Mesophilic acidophilic bacteria, *Coagulase Positive Staphylococci*, mould and yeast, and Lactic acid bacteria were reported. The average PH was measured around 6. The number of *Coagulase Positive Staphylococci* in 58.33% of samples was more than permitted limit. Because *Mahyaveh* is produced and consume locally and traditionally in south of Iran and also widely in all over the world, analyzing and controlling the microbial and chemical features of it, is necessary to prevent diseases¹.

Introduction

Mahyaveh is a fermented fish sauce that is served as a main dish in south of Iran(Bandar Abbas, Fars, Hormozgan). It is prepared with materials which are found and available in different regions for example type of the fish and the spice. It has various names depending on the country from which it is produced, such as *nampla* (Thailand), *bakasang* (Indonesia), *yu-lu* (China), *patis* (Philippines), *shotshuru* (Japan), *aekjeot* (Korea). In Iran it is called *Mahyaveh*, *Mahweh* or *Suragh*. there are a lot of different methods of production and compositions of the ingredients in this fermented product. Fish sauce (*Mahyaveh*) is considered as a rich source of protein and contains essential amino acids like lysine. Lots of vitamins and minerals are found in it and this is a rich source of B12 vitamins, sodium, calcium, magnesium, iron, manganese, and phosphorus³⁻⁴(figure 1, 2).

Nutrition Facts	
Portion Size	16 g
Amount Per Portion	
Calories	5.6
% Daily Value *	
Total Fat	0g 0 %
Sodium	1256mg 55 %
Total Carbohydrate	0.6g 0 %
Dietary Fiber	0g 0 %
Sugar	0.6g
Protein	0.8g 2 %
Vitamin D	0mcg 0 %
Calcium	6.9mg 1 %
Iron	0.1mg 1 %
Potassium	46mg 1 %
* The % Daily Value (DV) tells you how much a nutrient in a serving of food contribute to a daily diet. 2000 calories a day is used for general nutrition advice.	



Figure(1):Sayed Mekawy Ibrahim(2010) ⁴

Figure(2) : Database, (2019)³

Type of the fish, salt concentration and fermentation time affect the bacterial population and the quality of *Mahyaveh*. Here salt acts as a preservative and reduce water activity, and spoilage bacteria do not have the ability to tolerate 6 to 8 percent or more of salt; and due to the high concentration of it in fermented products, the growth of pathogenic microorganisms is controlled. Most common bacteria which are found in *Mahyaveh* are *Bacillus*, *Alcaligenes*, *Aeromonas* and *Vibrio*, and the probable moulds are *Aspergillus* and *Penicillium*. *Candida* and *Saccharomyces* can be mentioned as yeasts⁵. Some microorganisms like *Enterobacteriaceae*, *Micrococcus* and *Lactobacillus* species produce biogenic amines (histamine, putrescin, tyramine and tryptamine); consumption foods which contain significant amount of such compounds can leads to food poisoning ⁶. In a study by Thapa et al. (2004) on two traditionally fermented fish products, *Negari* and *Hentak*, the levels of *Lactic acid bacteria* were 4 to 7.2, yeast 1 to 3.5, and *aerobic mesophilic bacteria* 4.3 to 3.7 log CFU/gr⁷. The number of *Bacillus cereus*, *Staphylococcus aureus*, and *Enterobacteriaceae* were the highest.

Material & method

In(2017), Ranjbar et al, to count the microbiota, 23 samples were collected form *Zarin Dash City*, Fars Province. 10 g from each samples were mixed with 90 ml sterile normal saline solution. For total count of *lactic acid bacteria*, *acidophilic mesophilic bacteria*, *Coagulase Positive Staphylococci* and *mold* and *yeast* table(1). To measure the pH of the samples, a digital pH meter was used. acidity of the samples was measured according to AOAC, 1998.

lactic acid bacteria	MRS Agar	40°C for 72 hours/ anaerobic condition
acidophilic mesophilic bacteria	Plat count agar	30°C for 48 h
Coagulase Positive Staphylococci	Baird-parker agar	37°C for 24 hours
mold and yeast	Dichloran Rose Bengal chloramphenicol (DRBC) agar	25°C for 3-7 days

Table (1): material & method in Maryam Ranjbar, (2017)¹

Since there is no standard for *Mahyaveh* in Iran, the results were compared with Food and Agriculture Organization (FAO) standard for fish sauce¹. In (2022), Fatemeh Kaviani et al, since they wanted to analyze the effect of the salt concentration, the type of the fish and the fermentation time, 3 type of *Mahyaveh* were prepared according to the type the fish(tuna, anchovies, and sardines). First tuna, anchovies and sardine were washed and then cut to a size of 6 cm. each of them was mixed with water in a ratio Of 1 to 1 and then salt added according to defined salt concentration. The fish, water and salt were mixed in a mixer and then transferred in dishes and lids were closed with three layer plastic films. Each of them base on the treatment were kept in incubator for 30, 75 and 120 days at 37°C. After passing the fermentation time of each treatment, the samples were passed through a sterile cleaning cloth. Then, the filtered extract was mixed with 10% mustard and the samples were kept at environment temperature for 10 to 15 days².

Treatment	Fish type	salt concentration (%ww-1)	Time (day)
1	1	15	75
2	1	25	120
3	2	25	75
4	2	25	75
5	2	25	75
6	3	15	75
7	1	25	30
8	3	25	120
9	3	35	75
10	2	15	30
11	2	15	120
12	1	35	75
13	3	25	30
14	2	35	30
15	2	35	120

Table (2): 15 treatments / (2022), Fatemeh Kaviani (2022)²

They prepared 0.9% salt solution in distilled and sterile water and then mixed 9 ml of it with 1 ml of each sample extract. In (2022) Fatemeh Kaviani et al, to measure the total *Microccus*, *Bacillus* and *Enterococcus* microbial count, plate count agar (PCA), Mannitol salt agar (MS-A), Dextrose Tryptone Agar and Violet red bile agar were used. The microbiota of samples were counted with pour plate and double cultivation method. MSA plates, *Enterobacteriaceae* and *Bacillus* respectively were incubated at 30°C for 48 h, at 37°C for 24h and at 35°C for 48 h. *Box-Behnken Response Surface Methodology* was used to design the treatments and optimize the extraction conditions and achieve the *Mahyaveh* with the lowest microbial load².

Results

In the (2017), Rnjbar et al, the minimum, maximum, mean, and standard deviation of the total count of *mesophilic acidophilic bacteria*, *Coagulase Positive Staphylococci*, mould and yeast, and lactic acid bacteria in *Mahyaveh* samples presented¹.

Total count	Min	Max	Mean±SD (log CFU/gr)
Mesophilic acidophilic bacteria	4.41	7.99	6.23 ± 0.91
Coagulase Positive Staphylococci	2	5.64	3.52 ± 1.08
Mould and yeast	1.00	3.40	2.27 ± 0.71
Lactic acid bacteria	4.15	7.50	5.78 ± 1.02

Table(3):Microbial properties of Mahyaveh samples Maryam Ranjbar, (2017) ¹

PH and, acidity and a comparison between the levels of *mesophilic acidophilic bacteria*, *Coagulase Positive Staphylococci* and the pH of the *Mahyaveh* samples with standard values in figure (3) and table (4) respectively¹.

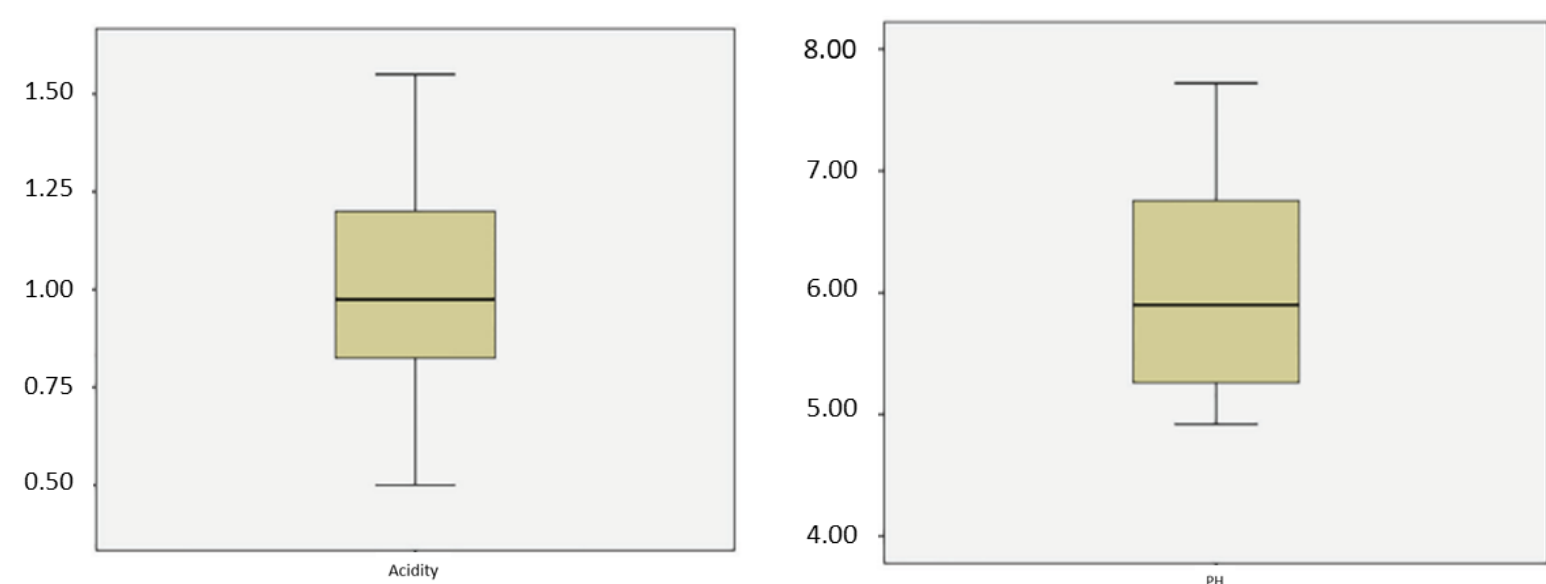


Figure (3): Average pH and acidity of the Mahyaveh samples/Maryam Ranjbar et al (2017) ¹

Parameters	Percentage more than the permitted limit	Permitted limit
Mesophilic acidophilic bacteria (log CFU/gr)	۹۵/۴۵	<10 ⁵
Coagulase Positive Staphylococci (log CFU/gr)	۵۸/۳۳	<10 ³
pH	۳۰/۴۳	5-6.5

Table (4): Comparison of total microbial counts and pH with standards/Maryam Ranjbar et al (2017) ¹

Treatme nt	Micrococcus (log cfu ml-1)	Enterobacteriaceae (log cfu ml-1)	Bacillus (log cfu ml)
1	4.991	2.041	4.491
2	1.000	1.000	1.000
3	1.834	1.000	1.477
4	1.602	1.000	1.000
5	1.200	1.000	1.602
6	1.778	2.204	4.602
7	2.255	2.255	2.204
8	1.000	1.000	1.000
9	1.477	1.301	1.301
10*	5.146	4.398	4.633
11	2.362	2.322	2.322
12	1.000	1.000	1.000
13	2.342	2.301	2.114
14	2.255	2.176	2.176
15**	0.911	0.840	0.752

Table (5) Comparison between total count, *micrococcus*, *Enterobacteriaceae*, and *bacillus* of tested and predicted *Mahyaveh*, under different conditions.* The highest and ** the lowest microbial count. / (2022), Fatemeh Kaviani et al ¹

According to the analysis of variance response surface model (RSM) of microbial total microbial count, *Micrococcus*, *Enterobacteriaceae* and *Bacillus*, linear effects of salt concentration variables and fermentation time and the square effect of salt concentration on total microbial count, *Micrococcus*, *Enterobacteriaceae* and *Bacillus* of *Mahyaveh* sauce were significant. The linear and square effects of fish species on the microbial load were insignificant². In (2022), Fatemeh Kaviani et al, it was observed that the different conditions of production of *Mahyaveh* sauce had a significant effect on the total count of microbes. results showed that by the passing of fermentation time (from 30 to 120 days), increasing the salt concentration (from 15 to 35%) had a significant effect on reducing the population of microbes of *Mahyaveh* sauce. The type of fish did not have a significant effect on reducing the microbial population of *Mahyaveh* sauce².

Finally achievement the minimum total microbial count, *Micrococcus*, *Enterobacteriaceae* and *Bacillus* in the *Mahyaveh* sauce was obtained with at the time of 103.63 days of fermentation with the third type of fish (Sardine) and at a salt concentration of 29.38%⁴.

Discussion & Conclusion

Fish sauce is a good source of protein, amino acids, vitamins and minerals. It is widely used in South Asian countries and southern province of Iran. Through the fermentation process of Mhayaveh, lactic acid is produced by *Lactobacillus* and then leads to the reduction of the pH. Low pH, organic acids (lactic acid), and salt, are the most important preservatives in fish sauce. *Lactic acid bacteria* is one of the prominent microorganisms in fish sauce and has beneficial effects; for example *L.plantarum* and *L.casei* have negative decarboxylase activity, decrease the accumulation of histamine, putrescine, tyramine and tryptamine in some fish sauce⁸. Moreover some *Lactobacillus* can reduce production of biogenic amines due to their bacteriocin compounds. Isolating some lactic acid bacteria like *Tetragenococcus* from fermented fish products, can be used as starters for processing fermented products⁹. In Ranjbar et al, 58.33% of samples contained *Coagulase Positive Staphylococci* higher than standard limitation and as it grows at salt concentration of 7.5-15% and since *Mahyaveh* is served without processing, contamination of fish sauce with high amount of this bacteria is a risk for hygiene and safety of the food. In Rnajbar et al the average total count of mesophilic acidophilic bacteria in 95.45% of the samples reported higher than the standard level, therefore more attention to food safety is vital. Also it is find out that the number of yeasts gradually increases during storage of the *Mahyaveh*. In addition to the salt concentration, the type of the fish and the fermentation time, condition of processing(aerobe/ anaerobe) and pH affect the microbial load. According to studies that have been done about fish sauce, the microbial load of such fermented products is high but can be controlled easily¹⁻². further studies are necessary to provide more useful information about *Mahyave* as an Iranian fermented fish sauce.

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***Ferulago angulata*: a natural source of antioxidant activity in the Apiaceae family**

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Statement of the Problem

The activity of certain free radicals in the body can lead to various types of cancer, diabetes, heart failure, brain damage, premature aging, and overall weakness of the body's immune system. The use of natural antioxidants can be considered the main way to combat free radicals and regenerate damaged cells because they increase the efficiency of the body's immune system against various diseases.



Research Purpose

Ferulago angulata (Schltdl.) Boiss. is a plant with antioxidant properties, and the effects of its effective compounds on free radicals have been proven. In this brief summary, we will provide an overview of the botanical characteristics of this species, its compounds, and the mechanisms of action that make it an effective antioxidant.

Research Method

Our research primarily involved reviewing available reliable sources and scientific papers. We focused on identifying and analyzing the characteristics, compounds, and mechanisms of action of the plant as an antioxidant.



Results and Conclusion

Ferulago angulata (Schltdl.) Boiss., also known as Chavil in Persian, is a plant from the Apiaceae family that grows mostly in the Zagros highlands of Iran, northern Iraq, and Turkey. It is a monocarpic and aromatic perennial plant with a thick, erect, and sulcate stem, basal leaves, and small yellowish flowers that bloom between late May and late July. The results confirm that the extract of *F. angulata* has antioxidant properties, which have been demonstrated through animal models. The extract can help to strengthen the body's immune system by applying antioxidant activity in the blood serum, making it a potential natural antioxidant supplement for the pharmaceutical industry. The antioxidant activity of *F. angulata* is attributed to the presence of phenolic compounds, flavonoids, and certain monoterpenes such as a-pinene, b-pinene, cis-ocimene, and borneol acetate. Phenolic compounds' ability to donate electrons is the reason for their antioxidant properties, which trap and eliminate free radicals, thereby preventing chain reactions.



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Investigating the antifungal effect of aqueous and alcoholic extracts of

Myrtus communis leaves

against aflatoxin-producing *Aspergillus flavus*

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Statement of Problem: *Myrtus communis* is a shrub and evergreen plant that grows in the plains of Asian countries including Iran and Mediterranean countries. Previous studies show the presence of antifungal compounds in various plant extracts.

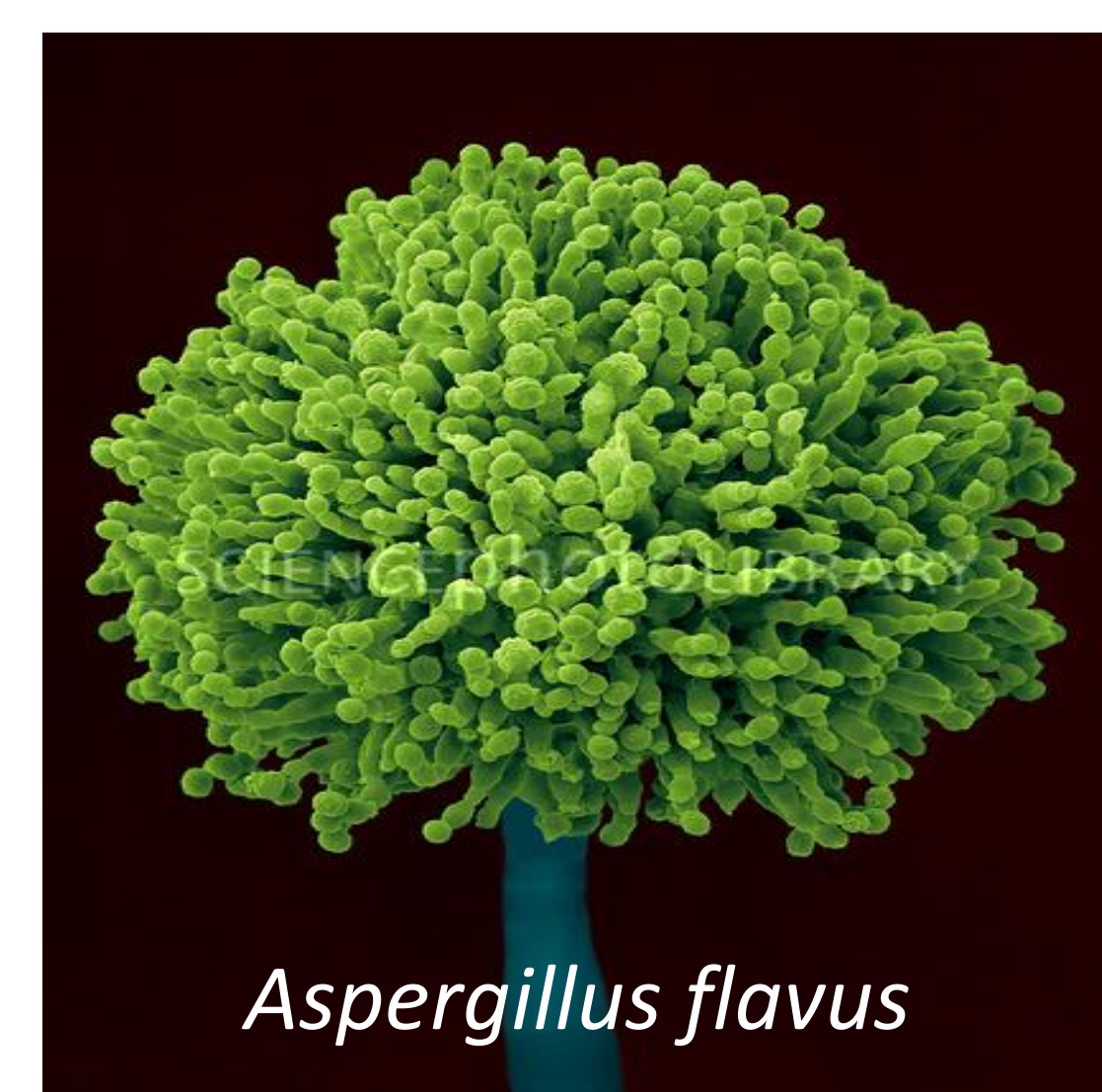
Research Purpose: The aim of this study was to investigate the antifungal activity of the aqueous and alcoholic extracts of this plant against *Aspergillus flavus*, which produces aflatoxin.

Research Method: The soaking method was used to prepare the aqueous extract of this plant. The antifungal activity of the aqueous and alcoholic extracts of the plant was determined by macrodilution and determination of MIC and MFC. The antioxidant properties of the plant extracts were determined by DPPH method.

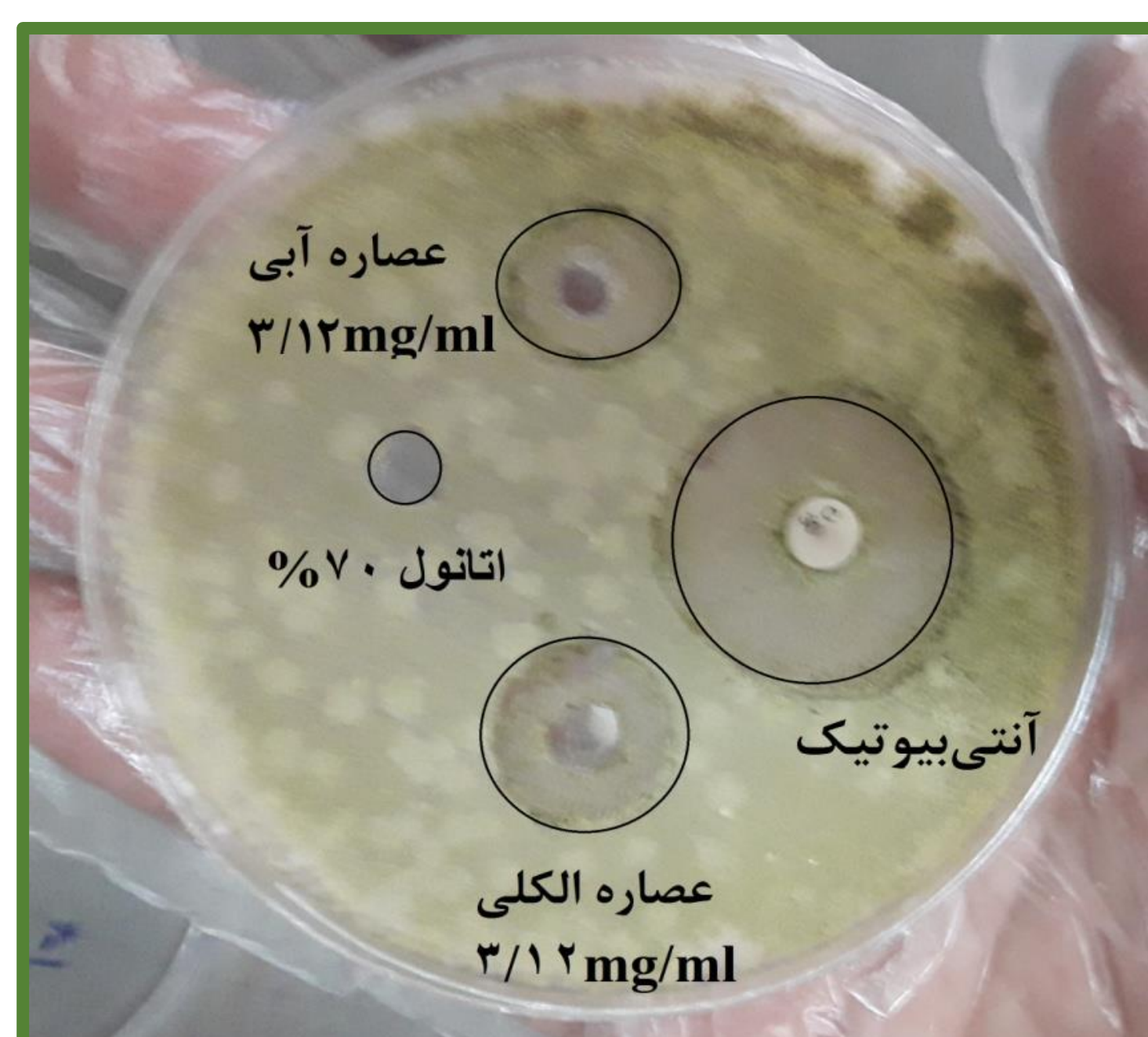
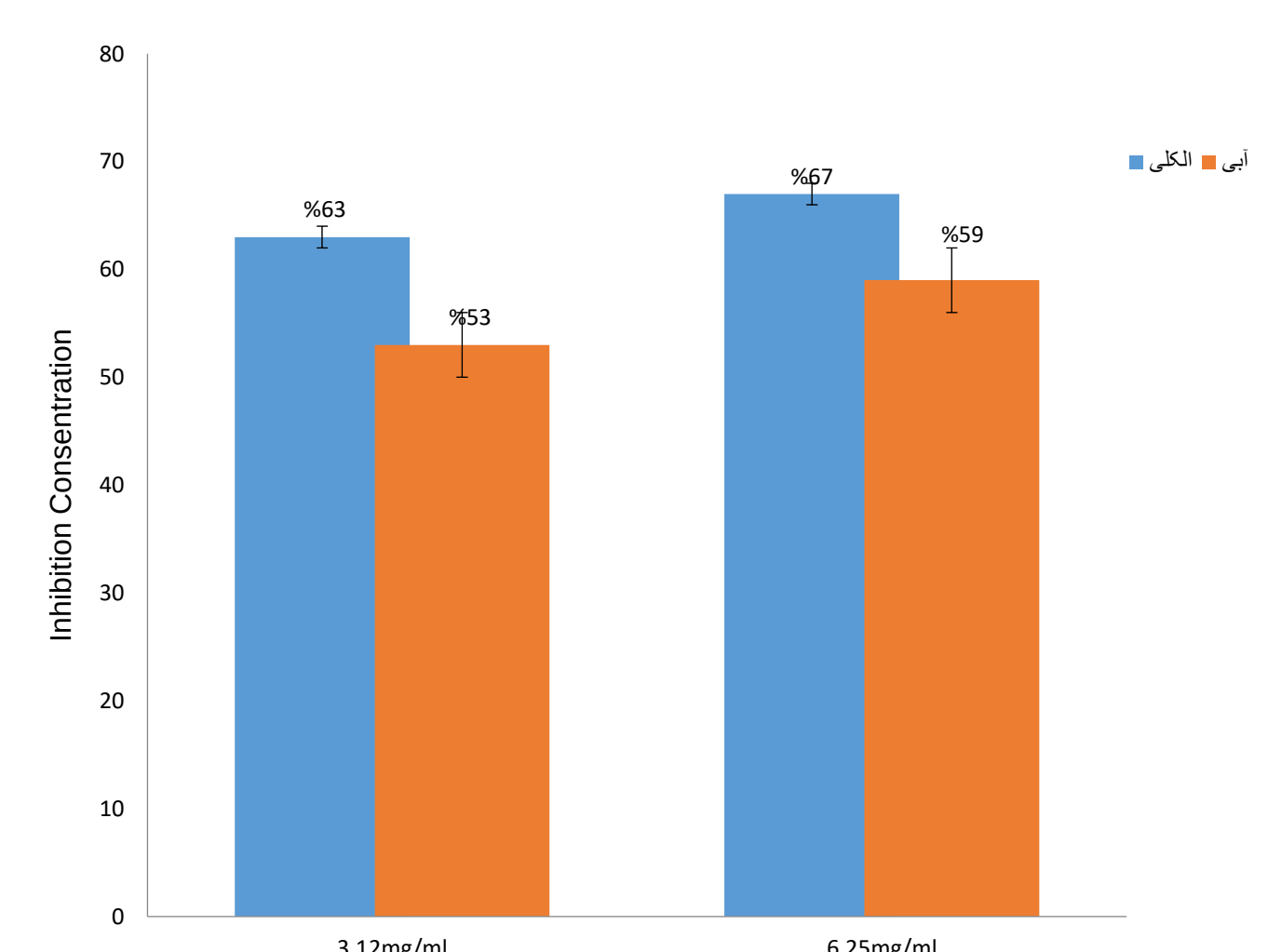
Results and Conclusion : The minimum inhibitory concentration (MIC) of the alcoholic extract on *A. flavus* was 3.12 mg/ml and the MIC of the aqueous extract was 6.25 mg/ml. Also, the minimum fungicidal concentration (MFC) of the alcoholic extract on *A. flavus* was 6.25 mg/ml and the MFC of the aqueous extract was 12.5 mg/ml. These results show that the alcoholic extract has better antifungal activity than the aqueous extract at both concentrations tested. The mean diameter of the non-growth halo of the extracts on *A. flavus* was smaller than the mean diameter of the non-growth halo of the antibiotic nystatin. The study of the antioxidant properties of the plant extracts using the DPPH method and the IC₅₀ of ascorbic acid as a positive control showed that the IC₅₀ value was 0.2 mg/ml for ascorbic acid and 3.6 mg/ml for the alcoholic extract and 4.71 mg/ml for the aqueous extract. By demonstrating the efficacy of the aqueous and alcoholic extracts of *Myrtus communis* against the strain of *A. flavus*, we can hope that in the future, by purifying the active substance of *Myrtus communis* and conducting further research, we will obtain combined herbal medicines with acceptable antifungal effects and low side effects. The identification and use of medicinal plant extracts may be useful in combating pathogens, especially fungi.



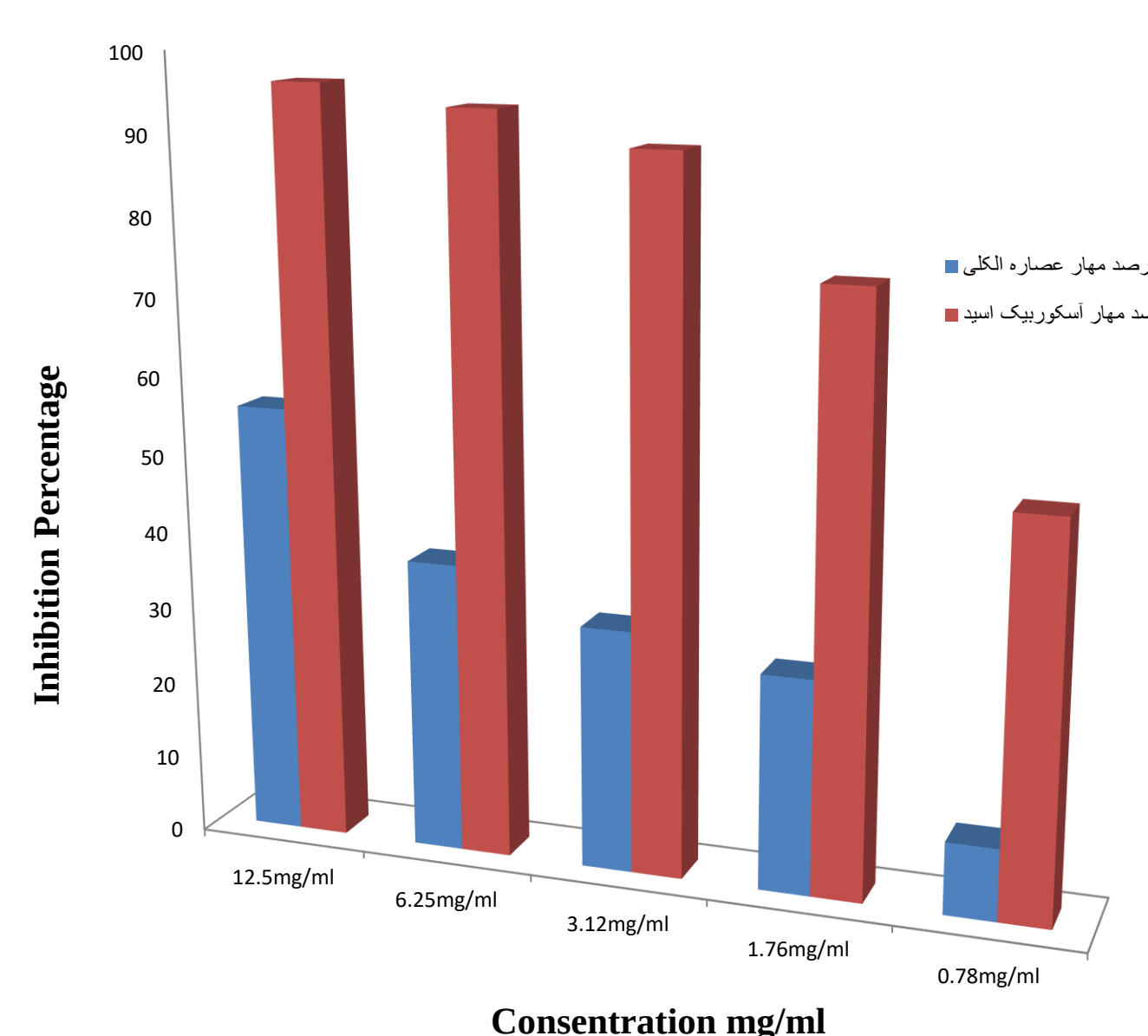
Myrtus communis



Aspergillus flavus



Non-growth halo of the extracts on *A. flavus*



Comparison of the effect of the alcoholic extract of the *Myrtus communis* and the standard ascorbic acid in different concentrations in inhibiting DPPH free radicals.

Comparison of the average diameter of the non-growth halo of aqueous and alcoholic extracts of the plant in different concentrations on *Aspergillus flavus*



The Effect of *Plantago major* on Wound Healing: A Review

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Statement of Problem: Wound healing is a complex pathophysiological process, which itself involves cellular and biochemical influences such as the pattern, structure, and deposition of collagen.

Research Purpose: To investigate the effectiveness of the topical use of *P. major* in healing skin wounds in animal models.

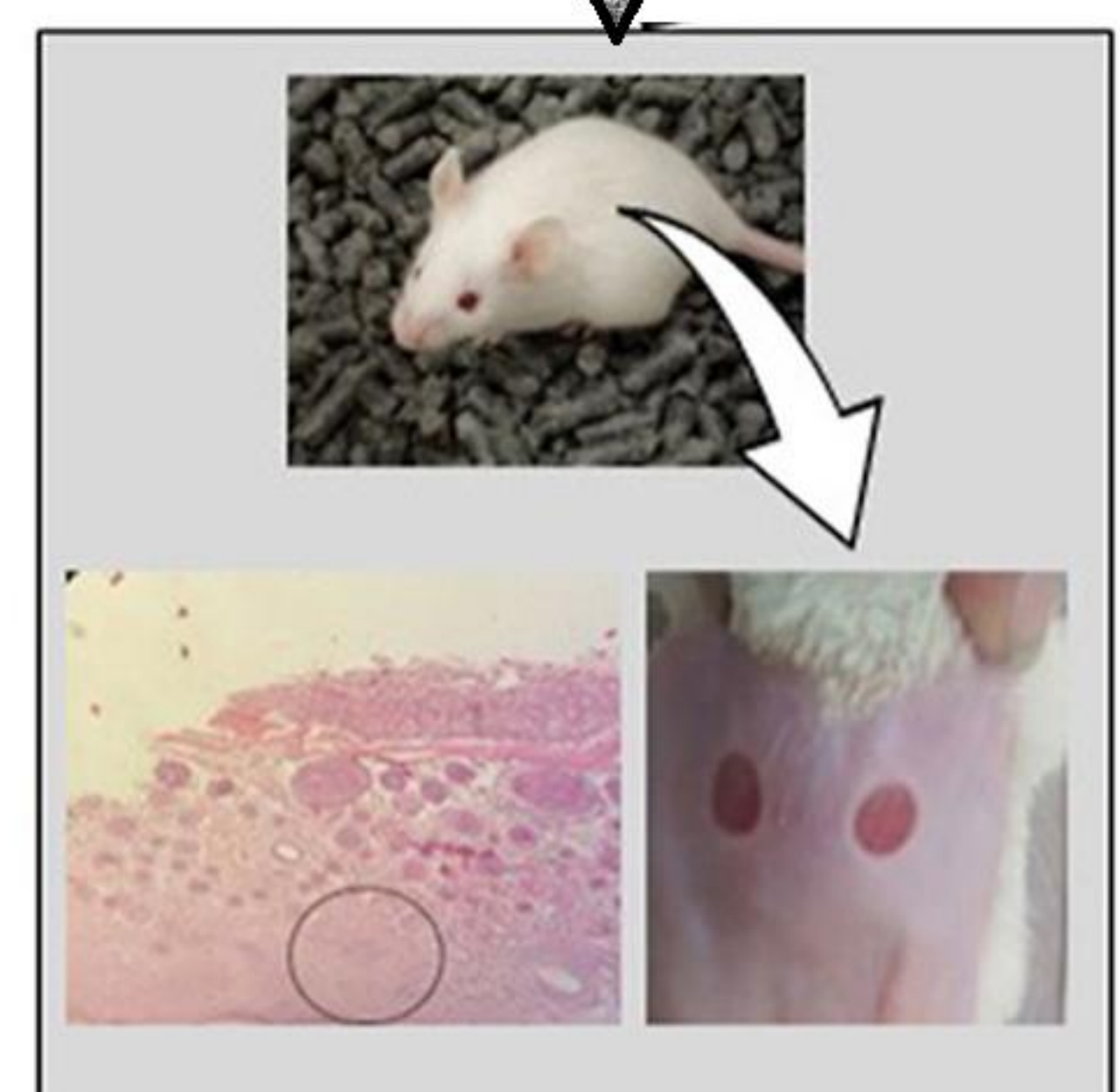
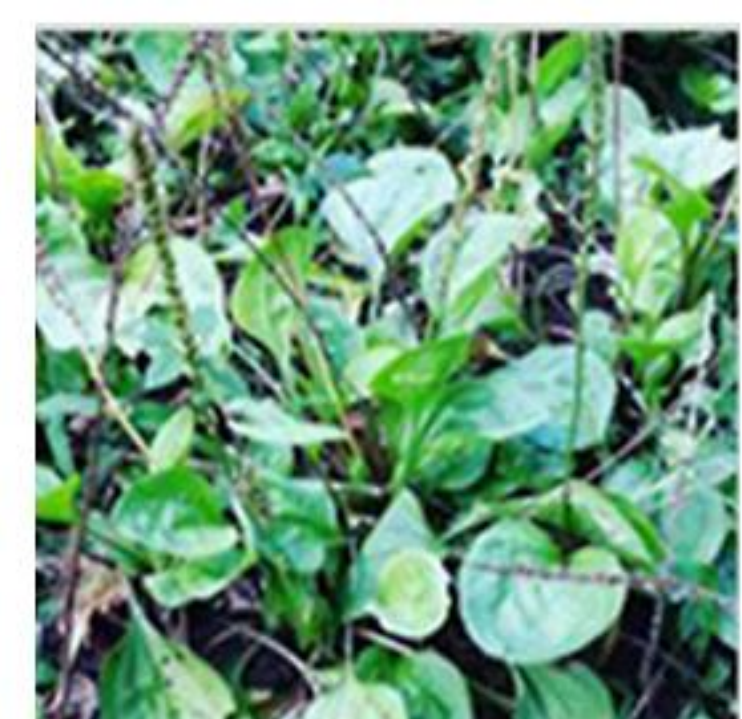
Research Method: A systematic review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Guidelines. Five (5) electronic databases (public/publisher Medline, Scopus, Web of Science, Embase and CAB Direct) were searched for controlled trials published in English from January 2015 to March 2023.

Results and Conclusion: Results indicating efficacious and accelerated healing process using *P. major* topical treatment have been described in the literature. Even though efficiencies of this plant species in cutaneous healing process is not yet clear. Healing rates will be evaluated in cutaneous wounds that received *P. major* topical treatment compared with wounds that received placebo/vehicle treatment. *P. major* extract concentration, best response, time of use, and cell markers that can be modulated by the treatment are important variables to assess treatment effectiveness.

Keywords: *Plantago major*, Wound Healing, animal models.

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Preparation of vegetable oils-based tissue adhesives for wound closure

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Abstract

This work aimed to develop a UV-curable non-isocyanate polyurethane tissue adhesive composed of vegetable oils functionalized through click-chemistry. For this purpose, a methacrylated quaternary ammonium version of soybean-oil linked through urethane bonds (MAQMSO) was prepared and its chemical structure was confirmed by spectroscopic methods. A mixture of MAQMSO, limonene, and a multifunctional thiol compound was subjected to simultaneous homopolymerization and thiol-ene click reaction in the presence of a UV-initiator after injection and irradiation by UV light.

Keywords: Tissue adhesive, Soybean oil, Limonene, Click chemistry

Introduction

Tissue adhesives provide many advantages for reconnection of the injured tissues compared to traditional invasive surgical closure techniques like sutures and staples. [1] There are different designing strategies for the preparation of suitable tissue adhesives. Click reactions with unique characteristics have attracted much attention for the preparation of polymeric materials with biomedical applications such as tissue adhesives. [2,3] UV-initiated thiol-ene type click reaction and simultaneous homopolymerization of double bonds were the selected methods in this study for the preparation of desirable cross-linked structure with high gel content.

Experimental

Epoxidized soybean oil (ESBO), Methanol, N,N-dimethyl ethylenediamine (DMEDA), 2-bromoethanol (2-BE), methacrylic anhydride (MA), limonene, pentaerythritol tetrakis(3-mercaptopropionate) (PETMP), and Diphenyl (2,4,6-trimethylbenzoyl)phosphine oxide (TPO) were purchased from Sigma-Aldrich. CO₂ gas was obtained from Roham Gas Company. MAQMSO was synthesized from ESBO by performing mild synthetic steps as follows; 1) trans esterification of ESBO with methanol at room temperature (R.T.) for 1h (EMSO), 2) preparation of cyclic carbonated methyl soyate (CMSO) from the reaction of CO₂ gas with EMSO, 3) ring opening reaction of CMSO with DMEDA at R.T. (AMSO) and formation of urethane linkages towards non-isocyanate route, 4) obtaining quaternary ammonium version of AMSO by reacting with 2-BE, and 5) imparting photo-curable methacrylated groups in the structure via reacting QMSO with MA at 0-25 °C (MAQMSO).

Cured adhesive samples were prepared from mixing proper amounts of MAQMSO, limonene (reactive diluent), PETMP (multifunctional thiol crosslinker), and TPO (UV-initiator), followed by casting on a Teflon mold, and irradiation by UV light (365 nm) for 5 minutes.

Results and discussion

Despite the presence of thiol groups in the adhesive formulation, application of limonene as the reactive diluent resulted in creation of a pleasant mild smell of lemon peel in the formulation and final product. Formation of quaternary ammonium groups (and so the Br⁻ counter ions) and homogeneity of the structure were confirmed by proper Bromine (white dots) and sulfur (red dots) distribution maps using EDX analysis running on the sample cross-section. (Fig. 1)

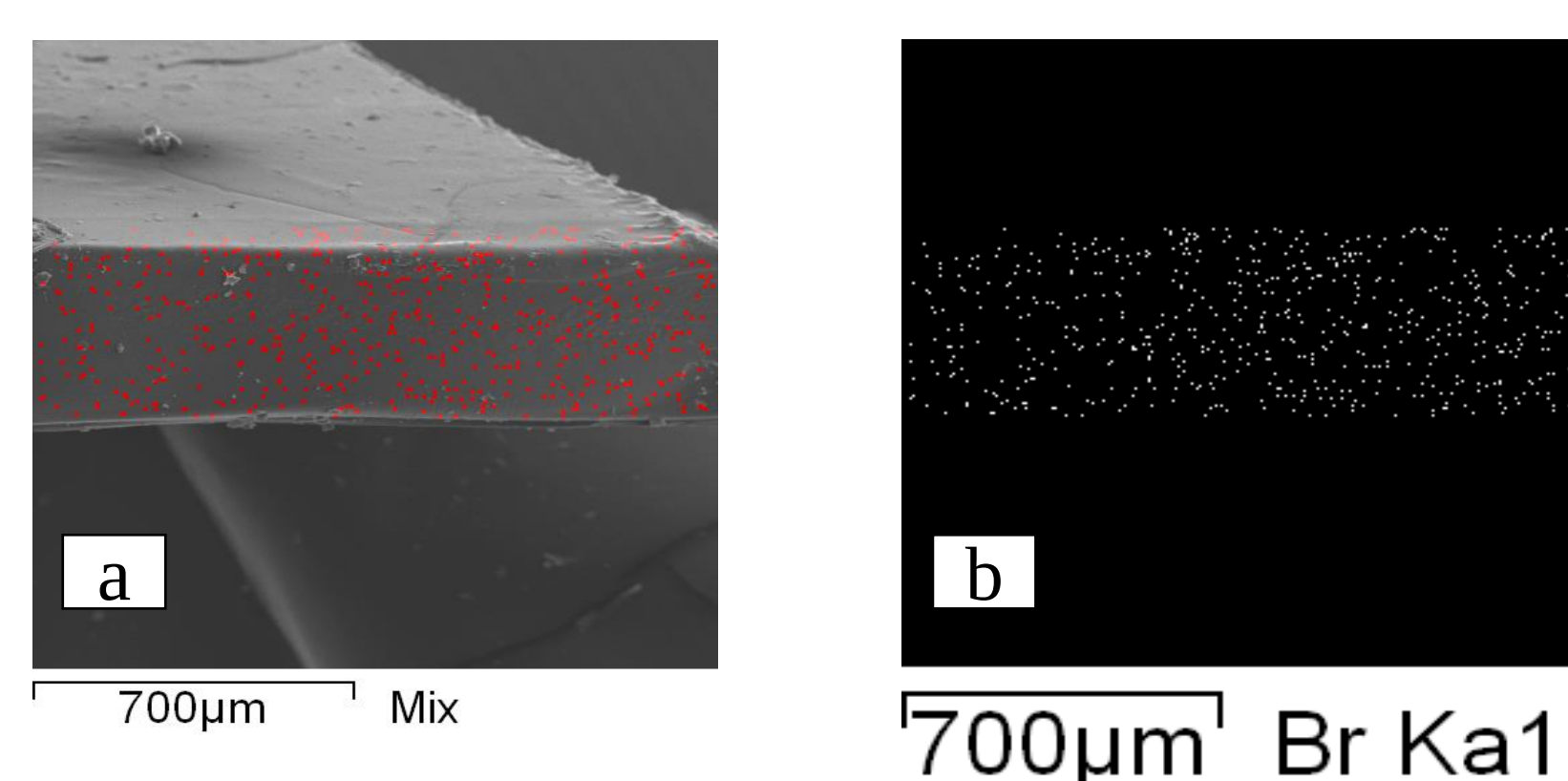


Figure 1. a) Sulfur and b) bromine distribution maps on the sample cross-section.

Surface energy value of the adhesive sample (45.65 mN/m) determined through contact angle measurements based on Owens-Wendt method, was lower than that of the skin (38–56 mN/m), which indicate proper thermodynamic adhesion between adhesive and skin. [2] DMTA results revealed that glass transition temperature of the cured adhesive (about 24 °C) is lower than body temperature and provides flexible joint with adhesion strength of about 370 kPa (Calculated through lap shear test) between two skin layers. The Fibroblast cells metabolic activity was qualitatively and quantitatively evaluated by visual inception of cells morphology and MTT assay for those cells cultivated directly on adhesive sample, respectively. This analysis confirmed proper cytocompatibility (cell viability of about 88%) of the adhesive sample.

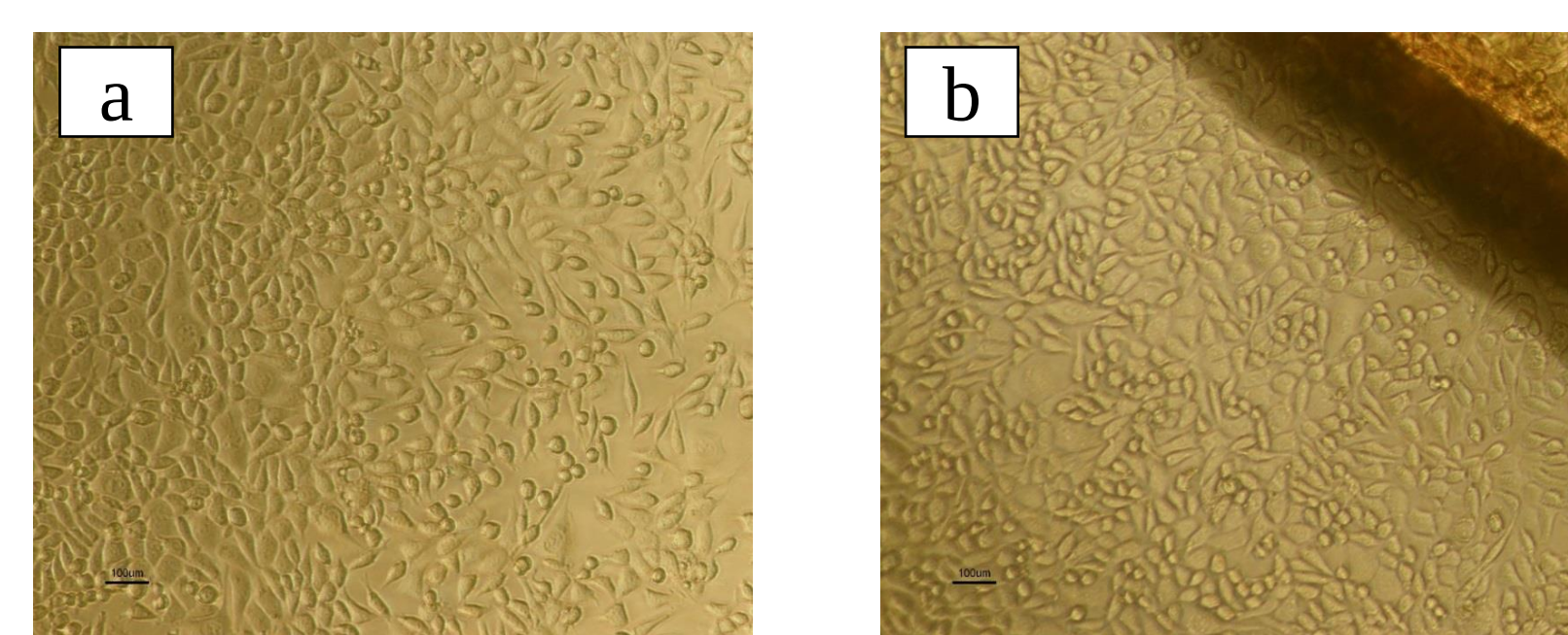


Figure 2. Optical microscopy images of L-929 cells in direct contact with a) control and b) adhesive sample.

Conclusions

The Prepared tissue adhesive with the pleasant smell of lemon peel represents high gel content, good adhesion strength and surface energy, proper biocompatibility towards fibroblast cells, homogeneous distribution of quaternary ammonium groups in the structure, and glass transition temperature lower than body temperature.

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Synthesis and evaluation of a tannin derived tissue adhesive

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Abstract

This work aims to synthesize and evaluate a novel tannin-based UV-curable tissue adhesive. For this purpose, a methacrylated version of tannic acid (TA-GMA) and an unsaturated non-isocyanate urethane prepolymer (ISBOPHU) were prepared and their chemical structures were confirmed by spectroscopic methods. A mixture of ISBOPHU, TA-GMA, a reactive diluent, and a multifunctional thiol compound was subjected to simultaneous homopolymerization and thiol-ene click reaction in the presence of a UV-initiator after injection and irradiation by UV light.

Keywords: Tissue adhesive, tannic acid, itaconic acid, non-isocyanate polyurethane.

Introduction

Compared with traditional wound closure methods, tissue adhesives are less likely to damage the tissues and can promote wound healing without scar marks. [1] There is a great interest for utilization of bio-based materials in the preparation of tissue adhesives. [2] In this work tannic acid (Fig. 1), a natural polyphenol with potential antibacterial activity [3] was selected as an adhesion promoter and combined with an unsaturated non-isocyanate urethane prepolymer prepared from soybean oil, itaconic acid, CO₂ gas, and etc. Utilizing this synthetic methodology provides an opportunity to use an environmental pollutant material (CO₂) as feedstock for the urethane prepolymer formation instead of using potentially toxic diisocyanate compounds.

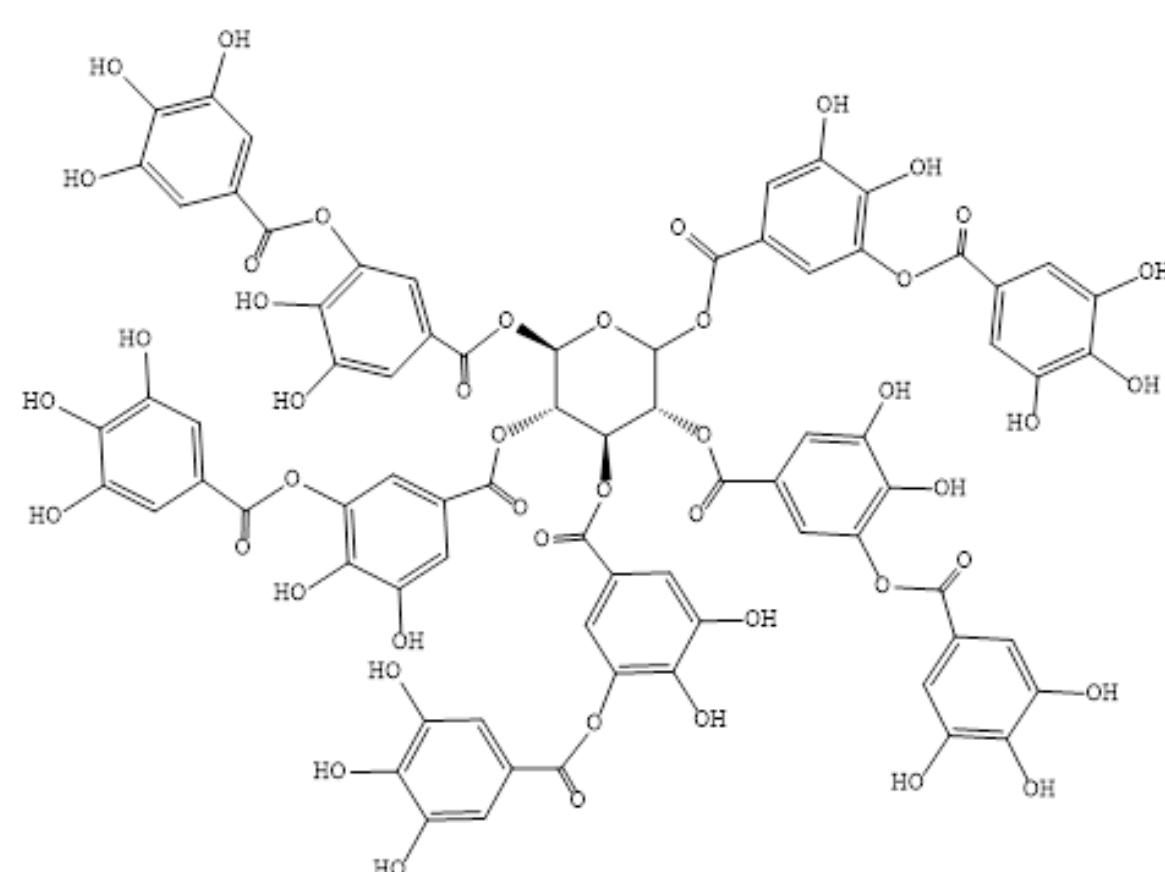


Figure 1. Chemical structure of tannic acid

In this study, simultaneous UV-initiated homopolymerization and thiol-ene type click reaction of double bonds were utilized for the preparation of desirable cross-linked structure of tissue adhesives.

Experimental

Epoxidized soybean oil (ESBO), ethanolamine (ETA), itaconic acid (IA), acetyl chloride, tannic acid (TA), glycidyl methacrylate (GMA), 2-Ethyl-2-(hydroxymethyl)-1,3-propanediol trimethacrylate (EHMPDTMA), pentaerythritol tetrakis(3-mercaptopropionate) (PETMP), and Diphenyl (2,4,6-trimethylbenzoyl)phosphine oxide (TPO) were purchased from Sigma-Aldrich. CO₂ gas was obtained from Roham Gas Company.

ISBOPHU was synthesized from ESBO by performing mild synthetic steps as follows; 1) preparation of cyclic carbonated soybean oil (CSBO) from the reaction of CO₂ gas with ESBO, 2) ring opening reaction of CSBO with ETA (SBOPHU) and formation of a polyhydroxyurethane towards non-isocyanate route, 3) imparting photo-curable unsaturated groups into the structure via reacting SBOPHU with itaconic anhydride (ISBOPHU). (Itaconic anhydride was obtained by the cyclization reaction of IA and acetyl chloride)

Methacrylated TA (TA-GMA) was prepared via methacrylation of TA with GMA with 1:10 molar ratio.

Cured adhesive samples were prepared from mixing proper amounts of ISBOPHU, TA-GMA, EHMPDTMA (reactive diluent), PETMP (multifunctional thiol crosslinker), and TPO (UV-initiator), followed by casting on a Teflon mold, and irradiation by UV light (365 nm) for 5 minutes.

Results and discussion

Surface energy value of the adhesive sample (57.87 mN/m) determined through contact angle measurements based on Owens-Wendt method, was near the one of the skin (38–56 mN/m) [4] The results of lap shear test confirmed the proper adhesion strength of the prepared adhesive (about 330 kPa) on gelatin sheets as a tissue mimicking material. The Fibroblast cells metabolic activity was qualitatively and quantitatively evaluated by visual inception of cells morphology and MTT assay for those cells cultivated directly on adhesive sample, respectively. This analysis confirmed proper cytocompatibility (cell viability of about 87%) of the adhesive sample.

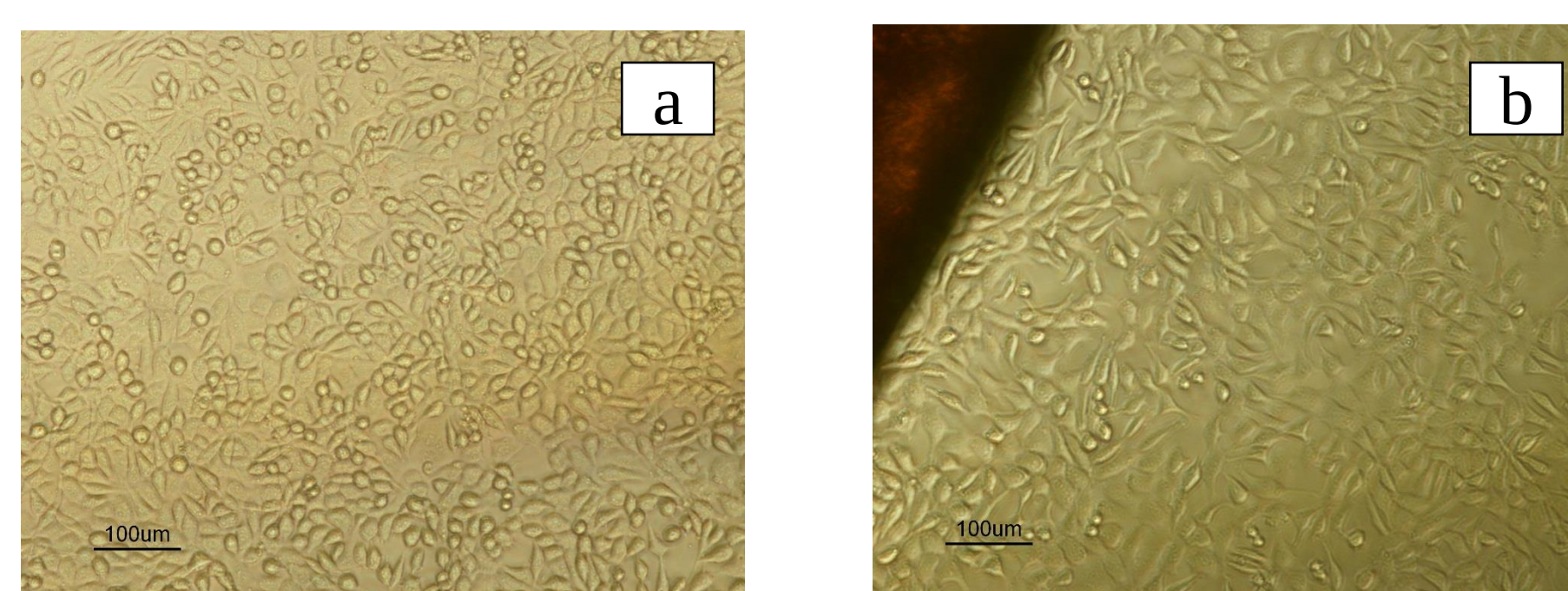


Figure 2. Optical microscopy images of L-929 cells in direct contact with a) control and b) adhesive sample.

Conclusions

This bio-based tissue adhesive represents desirable properties such as good adhesion strength, fast and effective curing process toward UV irradiation, and proper biocompatibility towards fibroblast cells.

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Investigation of water solubility of encapsulated rosemary essential oil in β -cyclodextrin

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Statement of Problem: *Salvia rosmarinus* (rosemary) is a fragrant evergreen flowering shrub which is belonged to the mint family. Rosemary essential oil (REO) is widely used in the pharmaceutical, traditional medicine, and food industries. Even though REO has many biological activities like anti-oxidant, anti-inflammatory, and anti-depressant, it is insoluble in water. Cyclodextrins (CDs) are chemical substances with natural resources. They have a cyclic truncated cone shape with a hydrophobic cavity and hydrophilic exterior. This distinguished structure allows the insertion of organic compounds into the cavity forming an inclusion complex to increase their water solubility(1-3).

Research Purpose: In this research, we tend to encapsulate REO with β -cyclodextrin to stabilize the REO and evaluate its water solubility.

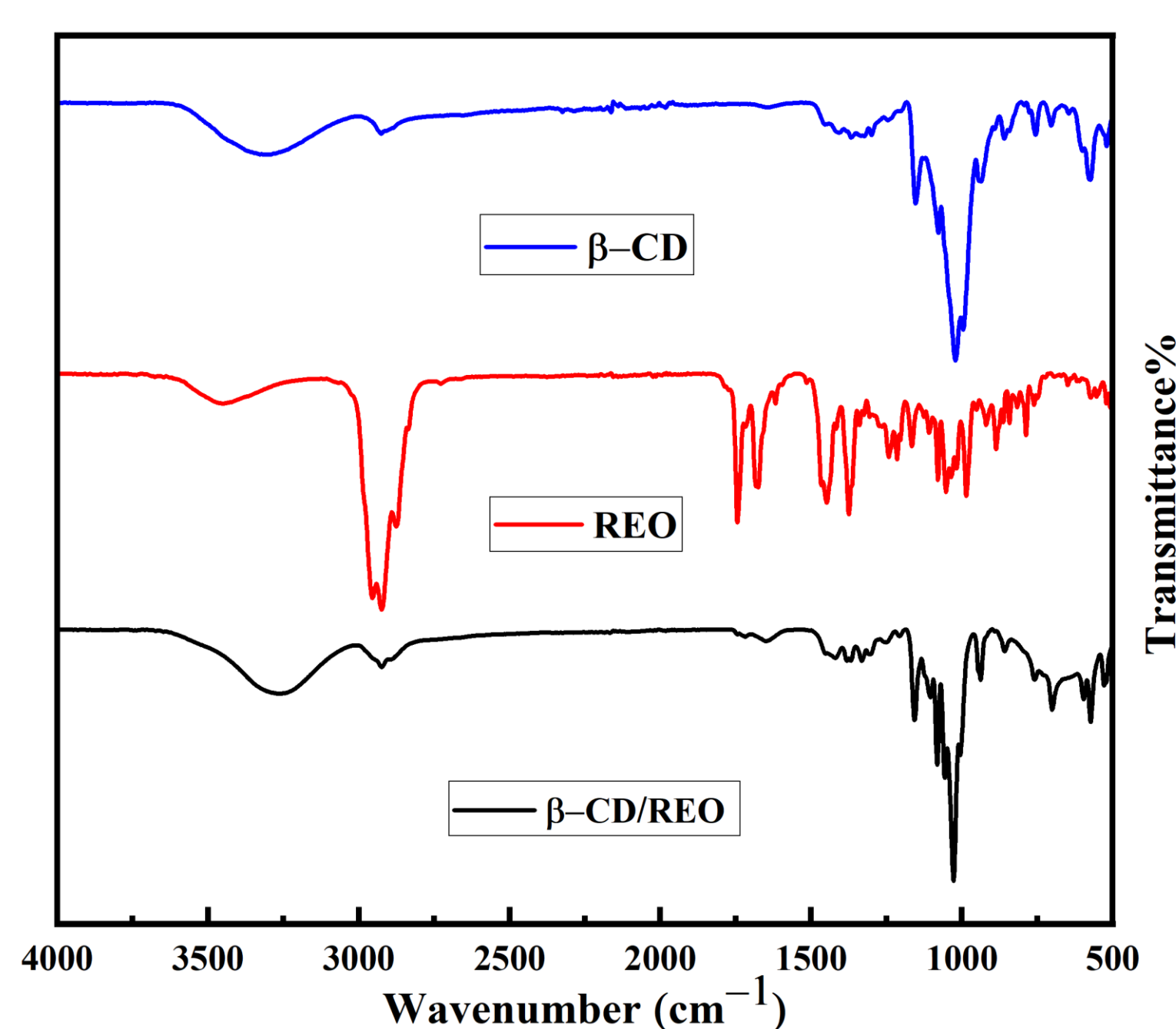


Figure 1. FT-IR spectra of β -CD, REO, and REO/ β -CD.

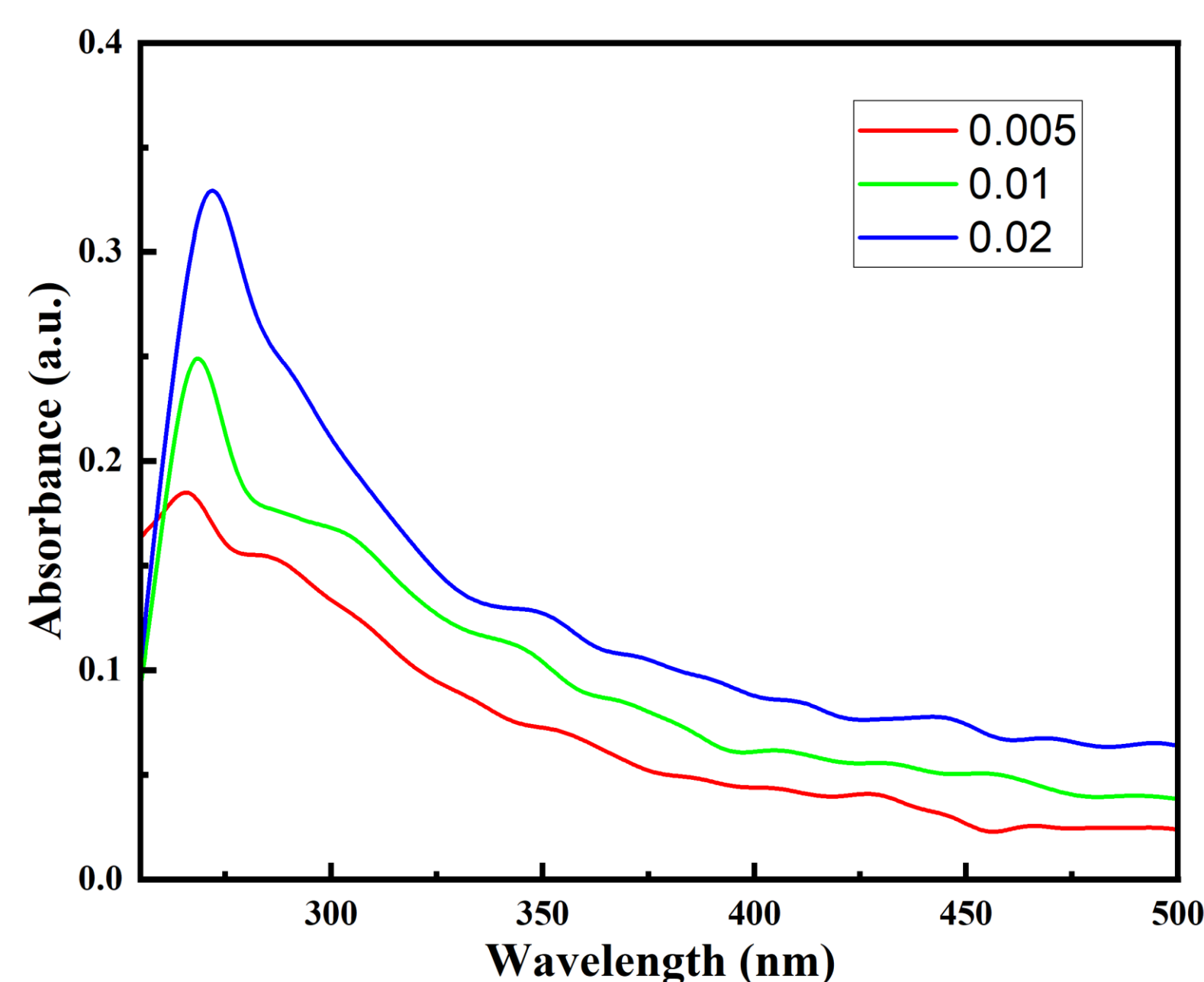


Figure 2. UV-Vis. absorption spectra of REO/ β -CD with different concentrations.

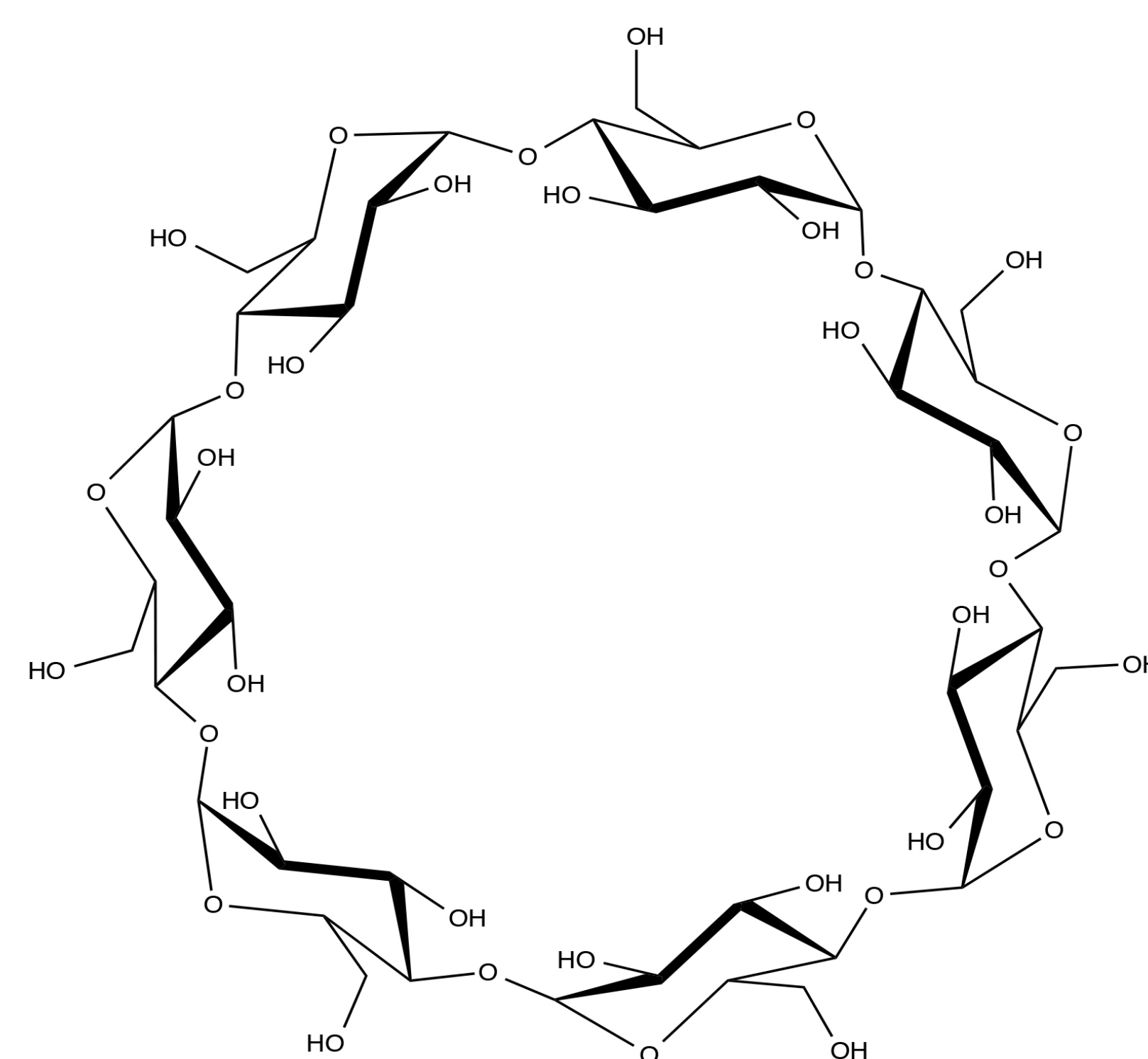


Figure 3. Representation of β -CD

Results and Conclusion: The formation of the inclusion complex was approved by the presence of a band at 1649 cm^{-1} in the FT-IR spectrum. Also, some characteristic peaks of β -CD are shifted due to the formation of the product. The UV-Vis. spectroscopy exhibited an increase in the water solubility of REO / β -CD to 1.5%.

In Our findings revealed the medical applications of REO will be increased and suited in aqueous media by preparing an encapsulate by β -CD due to the increasing water solubility.

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Encapsulation of eucalyptus essential oil using β -cyclodextrin and evaluation of its water solubility

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Statement of Problem: Eucalyptus is a flowering tree from the Myrtle family. It is native to Australia that has widespread applications in timber and pulpwood industries. Eucalyptus essential oil (EEO) is used as an abundant remedy in traditional medicine because of its multiple biological activities like anti-bacterial, anti-oxidant, disinfectant, chemotherapy, respiratory, and gastric. Water insolubility is one of the disadvantages of essential oils for medical usage. Cyclodextrins (CDs) play an important role in the drug encapsulation field as host molecules. They have hydrophobic cavity and hydrophilic exterior. This ability of CDs increases the water solubility of various molecules (1-4).

Research Purpose: In the present study, we prepared an encapsulation of EEO as a guest and β -CD as a host molecule using the co-precipitation method to increase the solubility of EEO.

Results and Conclusion:

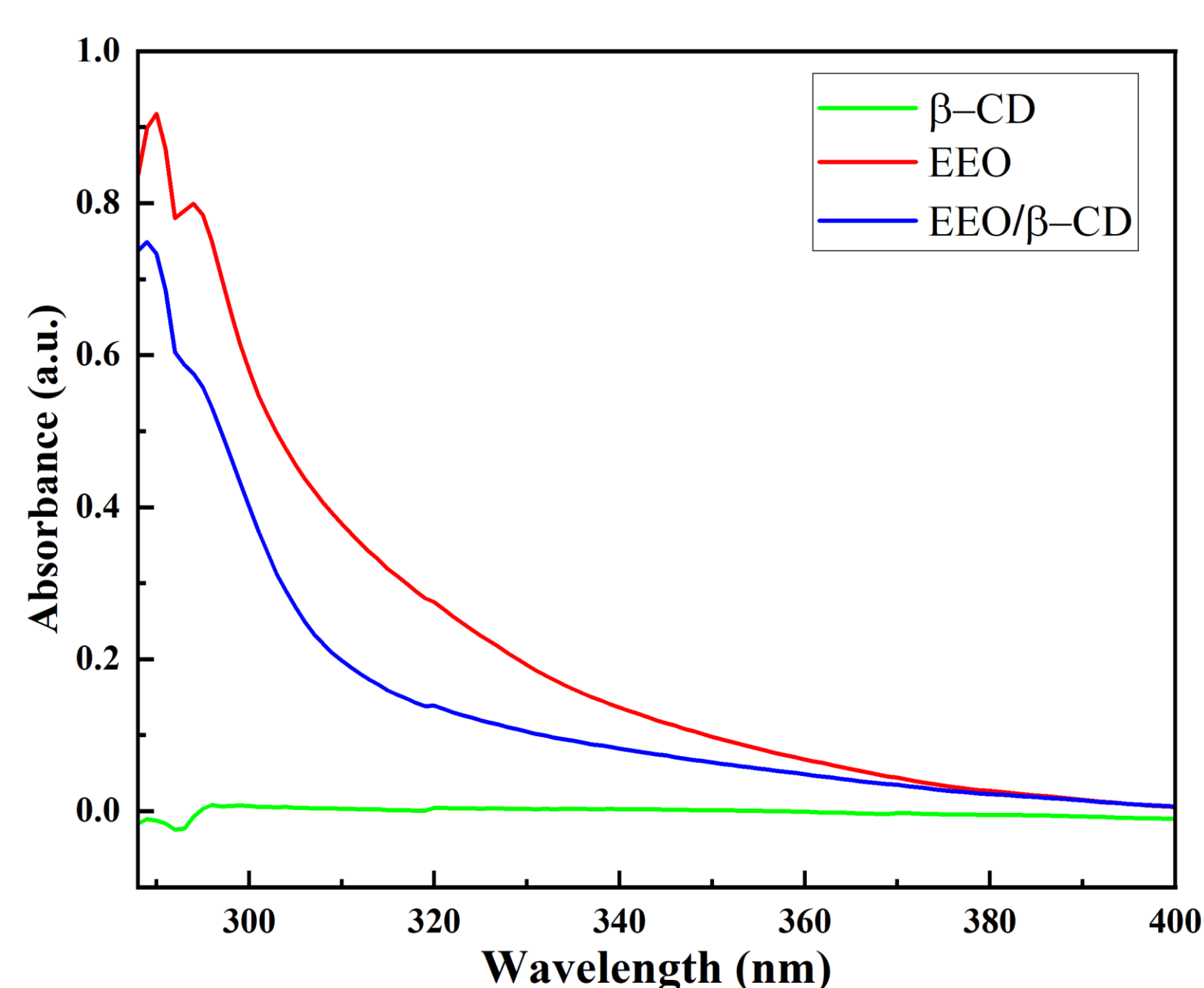


Figure 1. UV-Vis. spectra of β -CD, EEO, and EEO/ β -CD.

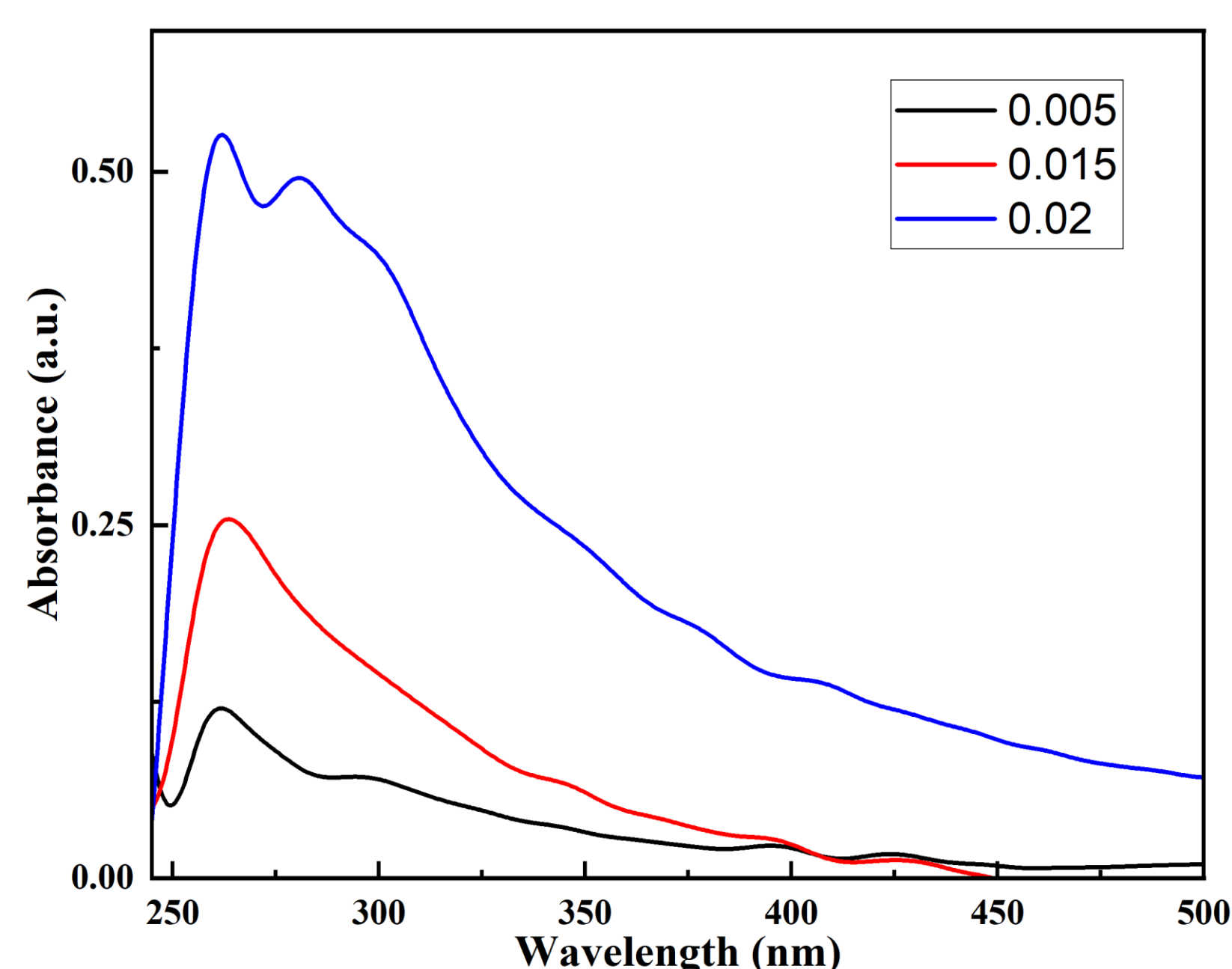


Figure 2. UV-Vis. absorption spectra of EEO/ β -CD with different concentrations.

Fig.1. represents the UV-Vis spectra of β -CD, EEO, and EEO / β -CD. The peaks at 289 and 294 nm confirmed the formation of the product. Furthermore, A concentration increase in water solubility of EEO/ β -CD was observed by UV- Vis. spectroscopy analysis (Fig.2.).

In conclusion, the solubility of eucalyptus essential oil was increased by the preparation of an inclusion complex using β -cyclodextrin.

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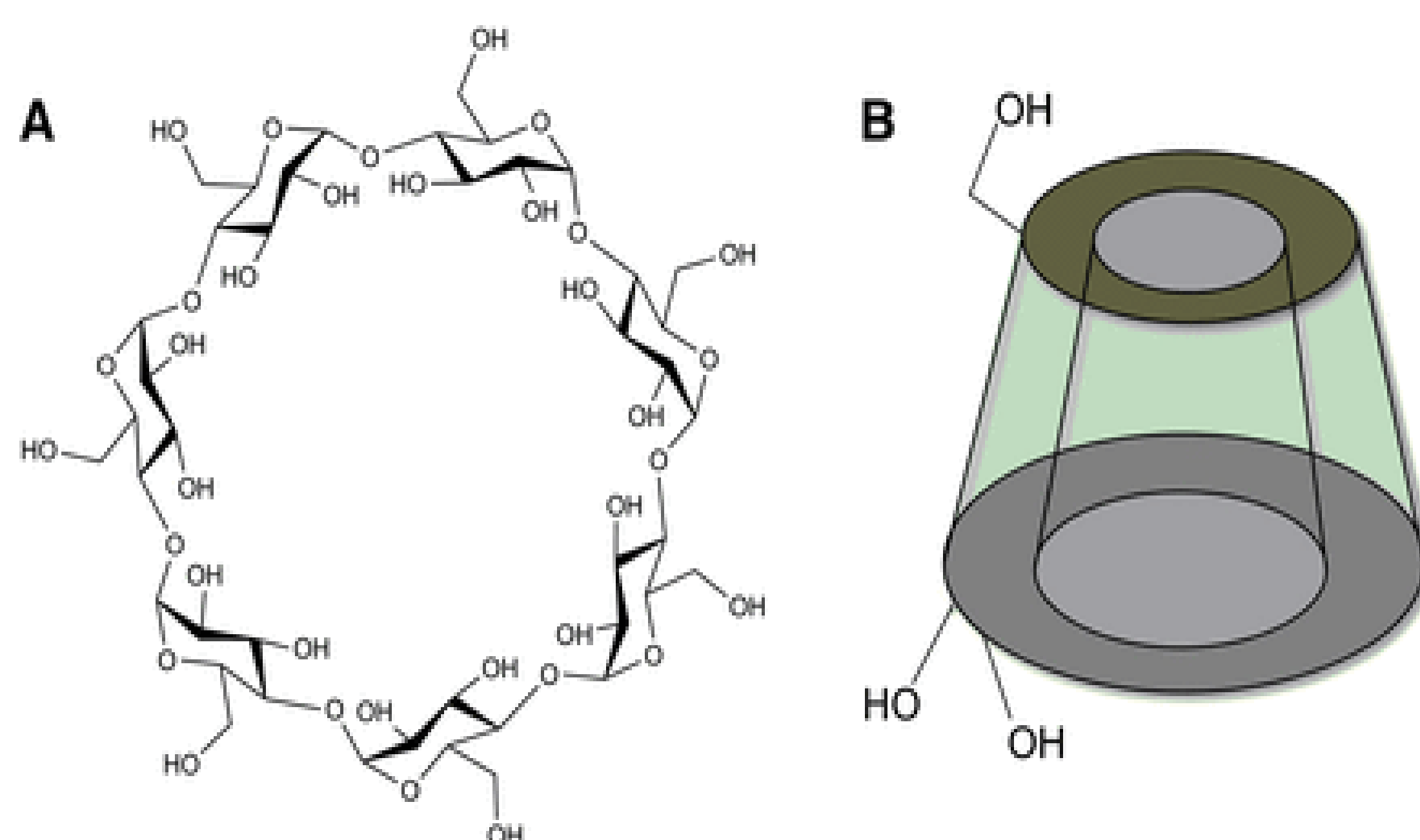


Figure 3. A) chemical structure and B) 3D structure of β -CD(5)



Allium akaka: a review of its phytochemical characteristics and traditional medicinal uses in Iran

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Statement of the Problem

Allium akaka S.G. Gmelin ex Schult. & Schult. f., locally known as "Vaalak," is a medicinal plant that belongs to the Amaryllidaceae family. It is endemic to Iran and listed as endangered due to over collection. Many diseases may be treated effectively using this plant as a herbal medication



Research Purpose

The purpose of this review summary is to investigate an endemic species of the genus *Allium* in Iran, with an emphasis on its phytochemical characteristics and potential medicinal properties as described in the literature.



Research Method

To investigate the use of wild *Allium* species in Iran, data from various sources were collected. Based on the available literature, information on the traditional uses of *Allium akaka* in Iran was gathered.

Results and Conclusion

In traditional medicine, *Allium* species have been used for blood purification, digestion problems, blood pressure reduction, headache, liver diseases, diarrhea, and arthritis. The sulfur compounds present in *Allium* plants are highly reactive, giving them strong antimicrobial effects. *Allium akaka* is a plant species used in Iranian traditional medicine for its potential wound healing, antibacterial, and anthelmintic properties. The plant is consumed as food and medicine, and young to flowering plants are eaten as a vegetable. It has been found to be beneficial for the treatment of cholera, tuberculosis, skin diseases, and rheumatism. The different parts of this species have been used in folk medicine for the treatment of infectious diseases, kidney stones, and cough. Additionally, the plant has therapeutic effects on diabetes, reducing the risk of atherosclerosis, and preventing hypertension caused by diabetes. The available literature suggests a link between the chemical content of *Allium akaka* and its therapeutic effects in traditional medicine. Thus, this plant has potential as a herbal medication for the mentioned ailments. However, more research is needed to confirm its effectiveness.



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Methods to modify and improvement of bacterial cellulose properties for versatile applications

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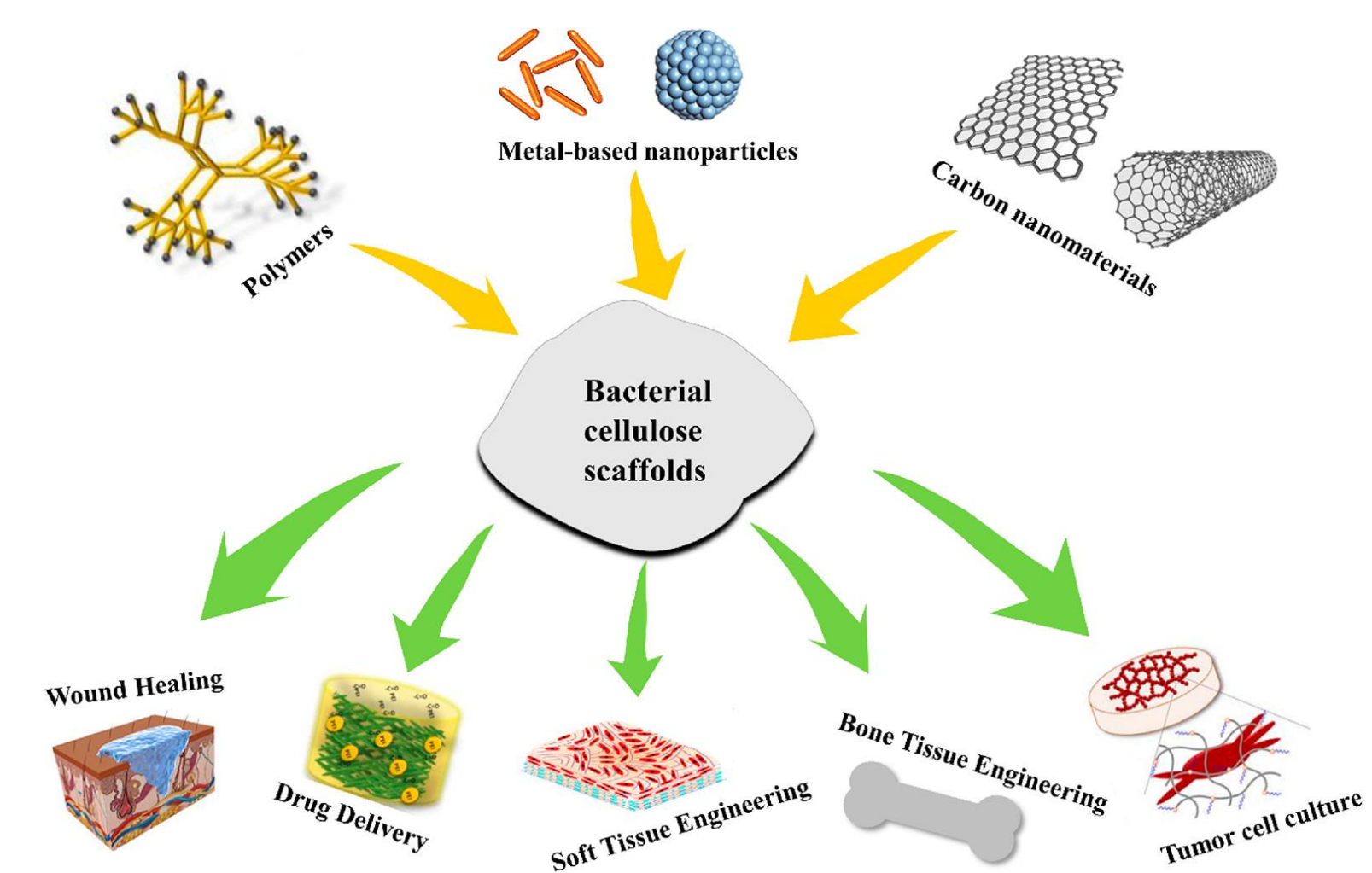
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Statement of Problem: Nowadays, due to the importance of green materials using bio-products or bio-based products such as biopolymers has attracted much attentions. These biomaterials have many applications in food industry, drug delivery, tissue engineering, and wound dressing and etc. Among all the biopolymers, bacterial cellulose (BC) is one of the most important candidates for such versatile usage. Chemical stability, high degree of polymerization, purity, renewability, high water holding capacity, tensile strength, and nontoxicity are important properties that make it an excellent choice for such applications.

Research Purpose: BC needs to be mixed with other biological or nonbiological material to be used in industries. But it has low affinity to these materials. Therefore, we need to find new ways to modify BC to improve its affinity.

Research Method: In this research related publications were extracted from various sources like Google scholar, PubMed, and Web of science based on key words like cellulose surface modification and bacterial cellulose.



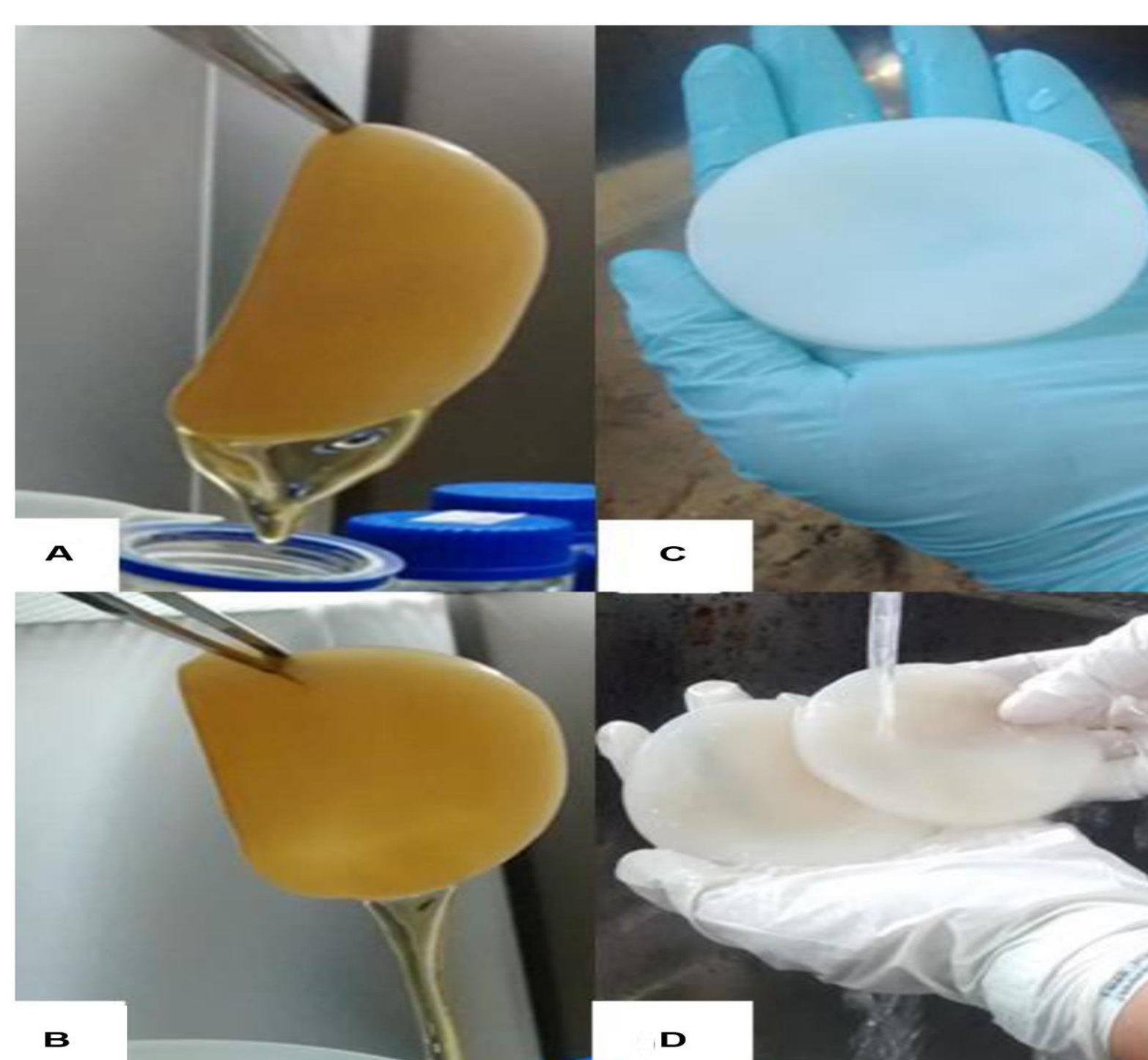
Different application of BC.

Results and Conclusion :According to our investigation, different ways have been reported to improve the affinity of BC to other compounds, polymers such as chitosan can be crosslinked with BC and donate strength and high water holding capacity to BC for food preservation, functionalizing with nanoparticles and biomolecules, making BC an interesting material for biosensor application, BC can be used as a drug delivery system and wound dressing to deliver antibacterial and antiseptic agents to limit bacterial growth. As an example, it has been used to control the delivery of curcumin to improve tissue granulation, in addition to its antifungal, anticancer, antibacterial and antioxidant properties. It has been used to deliver lidocaine to promote tissue repair in third degree burns in rats. Also, BC is considered generally recognize as safe by Food and Drug Administration since 1992 and can be used as a dietary fiber.

Keywords: Bacterial cellulose, Biopolymers, cellulose modification

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BC obtained from the culture medium before and after washing

Body detoxification with Honey Lemon Water, a recipe from traditional Persian medicine to modern-day knowledge

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Statement of Problem: Detoxification is the act of purifying the body by removing unwanted toxins, usually through the liver. Unprocessed toxins can lead to a wide range of symptoms including fatigue, depression, weight gain, indigestion, foul body odor, and skin problems. Many methods, both scientific and traditional, are suggested for detox, one of which is to use honey, lemon, and water as a drink. Honey lemon water is packed with antioxidants and helps the liver neutralize toxins, while its diuretic qualities promote their excretion in the urine. In Persian medicine, the combination of honey and lukewarm water, known as "Ma'al Asal," has been used for eliminating toxins from organs, treating respiratory issues, bolstering the immune system, relieving intestinal discomfort, and facilitating weight loss. Other substances, such as lemon, can be included to boost its efficiency.

This review investigated the effectiveness of Honey lemon water as an available detox agent and indicated its properties as Ma'al Asal in Persian medicine.

Research Method: For assessment of the efficiency of Honey lemon water as a widely available detoxifying agent and to investigate its status as Ma'al Asal in Persian medicine, databases such as PubMed, Scopus, SID, Magiran, and Google Scholar were consulted, along with major Persian medicine reference books in pharmacology including "Makhzan-al-advieh" and "Qarabadin Kabir".



Results and Conclusion : An invigorating combination of honey and lemon as an antioxidant-rich drink can help support cell regeneration, and provide essential vitamins to the body. Studies suggest it can help with fat burning and cleansing of toxins from the body, likely due to the low pH, hydrogen peroxide content, and antimicrobial properties. It is also known to be helpful in controlling glucose and lipid metabolism.

Because of the beneficial properties of honey lemony water, we believe it could be a safe and appropriate alternative to harmful soft drinks in the beverage industry going forward.

Vitamin C	→	Anti-inflammatory effects
Flavonoids	→	Protect against diabetes, dyslipidemia, and atherosclerosis
Electrolytes	→	Support with hydration
Apigenin, Quercetin	→	Anti-cancer
Hydrogen peroxide	→	Anti-bacterial



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Managing Alzheimer's disease based on Persian medicine, a new aspect of prevention & treatment

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Introduction: Alzheimer's disease (AD) is a chronic age-related neurodegenerative disease that causes memory loss. One of the probable mechanisms is the accumulation of a specific protein called amyloid beta ($A\beta$) around nerve cells, which affects their ability to communicate with each other effectively within the brain.

While there is no proven effective treatment or prevention for AD, in general, a healthy lifestyle can help combat associated risk factors such as smoking, poor diet, and inactivity. Centuries ago, Persian medicine presented "Nesian", which is almost the same as Alzheimer's.

Persian scholars have used lifestyle modification methods to treat "Nesian", including adjustments to diet, exercise, and sleep, as well as the properties of certain herbs including *Curcuma longa*, *Coriandrum sativum*, *Valeriana officinalis*, *Zingiber officinale*, *Cinnamon*, *Lavandula angustifolia*, *Boswellia carterii*, and *Melissa officinalis* which are confirmed by modern research. The aim of this review is to highlight Persian medicine's potential therapeutic prescriptions for the prevention and treatment of AD.



effects on $A\beta$ and tau proteins



recovers the SHSY-5Y cells from $A\beta_{1-42}$ oligomer

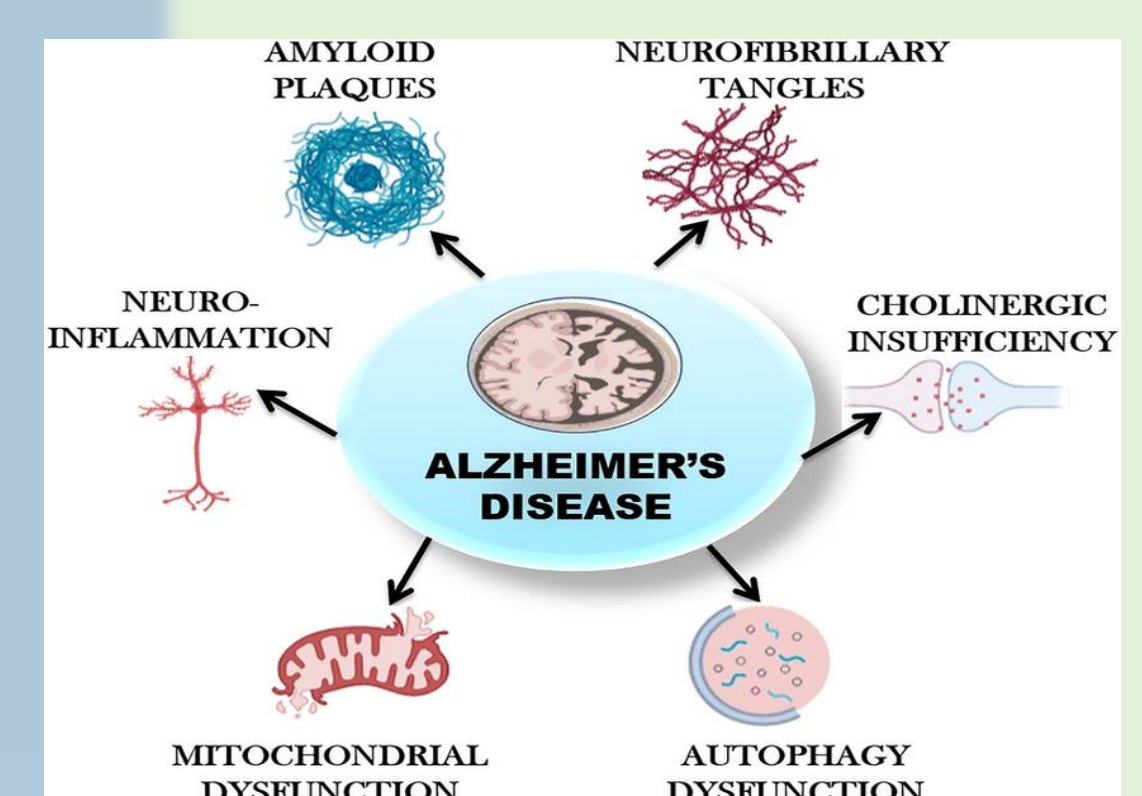
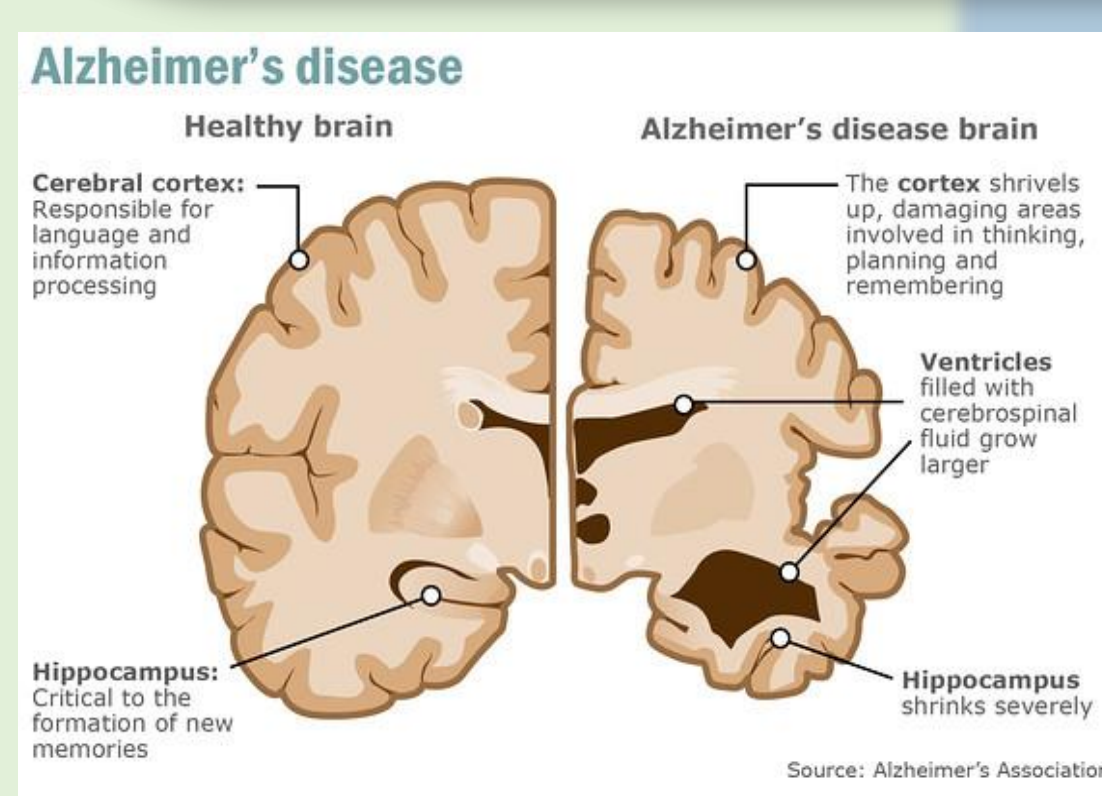


anti-amyloidogenic properties, inhibit $A\beta$ aggregation

Results and Conclusions : Many of Persian medicine's recommendations for the prevention and treatment of AD have been proven in the new research.

Sleep disturbances might enhance the risk of AD by increasing $A\beta$ burden and exercise may lower the risk of AD by increasing brain blood flow. Diet regimens can prevent, and slow the progression of AD by modulating inflammation. In addition, there are remarkable properties in plant-based compounds that have significant value in treating AD. For example, Curcumin, the active ingredient of *Curcuma longa*, decreases $A\beta$ production and aggregation.

All prescriptions for prevention or treatment of "Nesian" vary based on the brain temperament.



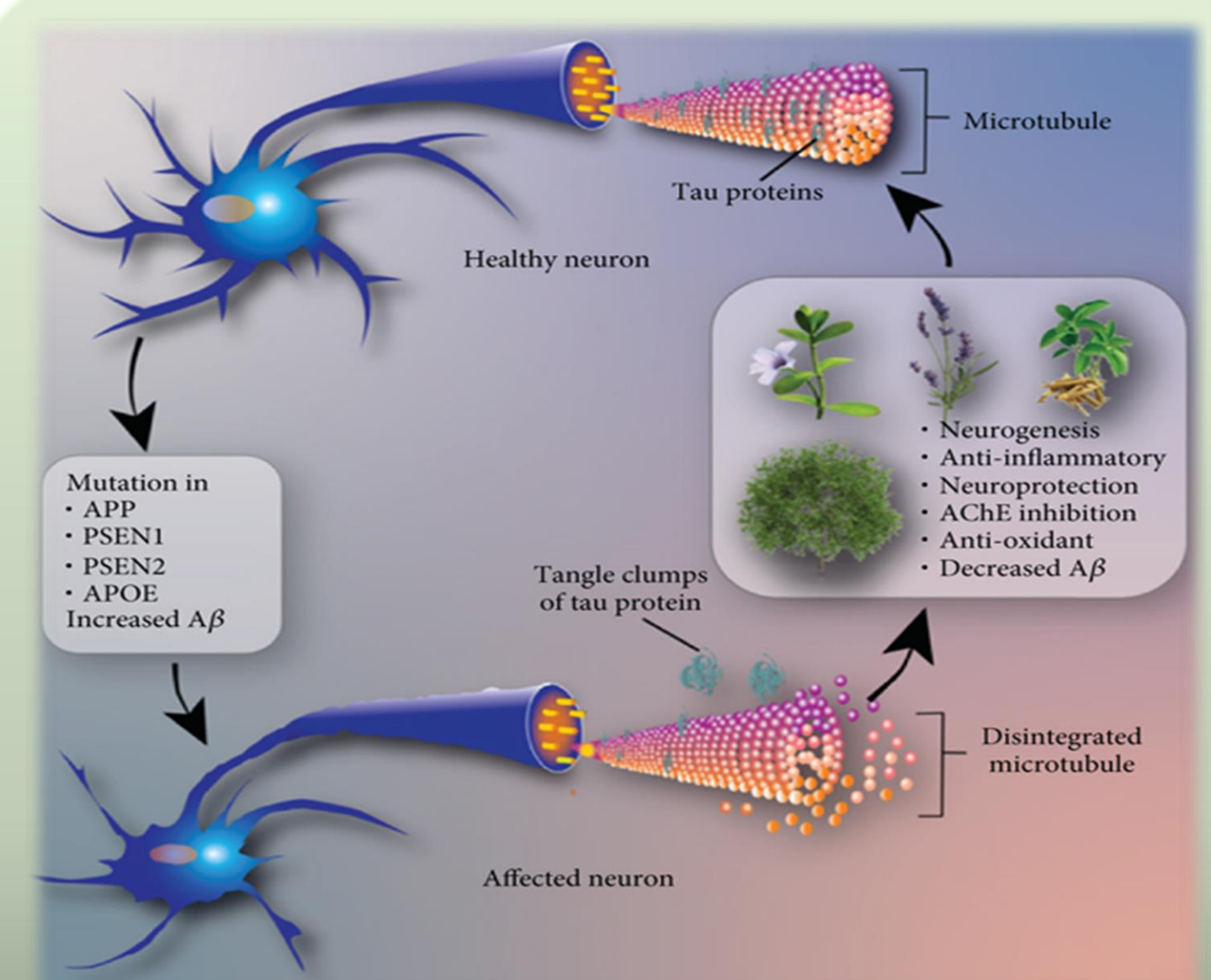
Material and methods: We searched databases Google Scholar, Pubmed, Scopus, SID, and Magiran with the keywords of Alzheimer's disease, Herbal medications, diet, sleep disorders, Nesian, and Persian Medicine, and investigated Persian medicine reference books including Ibne Sina's Qanoon, Exir-e Azam of Hakim Azam Khan Chashti, and Razi's Al-Havi.



neuroprotective effects via reduction of the BBB permeability



reduces tau proteins and beta-amyloid plaques



Mechanisms of Medicinal Plants for Alzheimer's Disease

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Evaluation of essential oil percentage diversity of Peppermint (*Mentha piperita* L.) accessions in Iran

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چکیده:

گیاهان دارویی یکی از منابع غنی ترکیبات مهم هستند که از گذشته‌های دور تا به امروز جایگاه ویژه‌ای در درمان بسیاری از بیماری‌ها پیدا کرده و دلیل مهمی برای مطالعات زیادی در مورد گیاهان دارویی شده است. هدف از این تحقیق مطالعه تاثیر روش های مختلف خشک کردن (سایه و آون) بر میزان اسانس (مرحله پنجاه درصد گلدهی) گیاه نعناع‌فلفلی می‌باشد. نعناع‌فلفلی (*Mentha piperita* L.) از خانواده Lamiaceae یکی از پر مصرف ترین گیاهان دارویی است که اثرات درمانی زیادی دارد. در این تحقیق توده‌های مختلف گیاه نعناع‌فلفلی از مناطق مختلف ایران جمع آوری شد. در تحقیق حاضر اثرات روش‌های مختلف خشک کردن بر میزان اسانس نعناع‌فلفلی در شرایط مزرعه بررسی گردید. آزمایش در قالب طرح بلوک‌های کامل تصادفی (RCBD) انجام شد. نتایج تجزیه واریانس یک طرفه (ANOVA) تفاوت معنی‌داری را بین ۱۲ توده نعناع فلفلی در هر دو روش خشک کردن نشان داد. مقایسه میانگین بین توده‌های مورد مطالعه نشان داد که بیشترین مقدار اسانس ۱۲/۲ درصد در روش خشک کردن در آون در توده تبریز بدست آمد و کمترین مقدار ۵۲/۰ درصد مربوط به توده فیروزآباد بود. در مقابل بیشترین درصد اسانس ۰۶/۲ درصد و کمترین درصد ۴۴/۰ به ترتیب در توده فیروزآباد و تبریز به روش خشک شد در سایه مشاهده شد. نتایج نشان داد که تنوع ژنتیکی قابل توجهی در میان توده‌های نعناع‌فلفلی در ایران وجود دارد.

کلید واژه: روش خشک کردن، میزان اسانس، نعناع‌فلفلی.

مقدمه:

در حال حاضر بررسی میزان تنوع ژنتیکی جمعیت در ذخایر توارثی گیاهی یکی از قدم‌های اولیه در اکثر برنامه‌های اصلاحی می‌باشد (Rahimmalek, 2012). بنابراین با این وجود به‌نژادگران سعی نمودند تا با بهره‌برداری از تنوع ژنتیکی موجود بین گیاهان دارویی، اصلاح میانگین تولید و پایداری اکولوژیکی را مورد توجه قرار دهند (pank, 2006). تیره نعناع شامل بیش از ۴۰۰۰ گونه و ۲۰۰ جنس است که بسیاری از آن‌ها گیاهان دارویی هستند. بیش‌تر گونه‌های تیره نعناع حاوی روغن‌های فرار هستند که فعالیت‌های بیولوژیکی در برابر پاتوژن‌ها از خود نشان می‌دهند (Snoussi et al. 2015). نعناع‌فلفلی یک هیبرید طبیعی از تلاقی میان پونه آبی (*M. aquatica*) و نعناع یا پونه سنبله‌ای (*M. spicaea*) می‌باشد (Sun et al. 2014). گونه‌های جنس *Mentha* به واسطه‌ی اسانس ارزشمندی که دارند در بیشتر مناطق دنیا اهمیت اقتصادی بالایی دارند. اسانس نعناع فلفلی نیز به عنوان جزئی از محصولات غذایی، آرایشی و بهداشتی به‌طور گسترده استفاده می‌شود (Adel et al. 2015). در تحقیقی دیگر به منظور بررسی تأثیر زمان‌های برداشت در کیفیت اسانس نعناع‌فلفلی و ۵ گونه دیگر نعناع‌فلفلی آزمایشی اجرا کردند. برگ‌ها در اولین مرحله گلدهی و وقتی که ۳۰ درصد گلدهی جمع‌آوری شدند. زمان برداشت تأثیر عمده‌ای بر ترکیب‌های عمده اسانس نداشت و میزان اسانس فقط در شروع گلدهی بالا بود (Aflatuni et al. 2000). با توجه به اینکه نعناع‌فلفلی یک گیاه ارزشمند است و اسانس آن نیز به عنوان جزئی از محصولات غذایی، آرایشی و بهداشتی به‌طور گسترده استفاده می‌شود، بنابراین هدف از انجام این آزمایش بررسی صفات میزان اسانس و تنوع آن در توده‌های مختلف این گیاه می‌باشد.

مواد و روش ها:

این پژوهش در استان اردبیل شهرستان مشگین‌شهر در قالب طرح بلوک کامل تصادفی با ۱۲ توده گیاه نعناع‌فلفلی خریداری شده از مناطق مختلف کشور شامل شهرهای اردبیل، همدان، کردستان، مشگین‌شهر، گلستان، نورآباد، فیروزآباد، زنجان، تبریز، ارومیه، شیراز و شیراز ۲ با ۳ تکرار اجرا شد. پس از آماده‌سازی زمین مورد نیاز، در اوایل اردیبهشت ماه و خرداد ۱۲ توده ریزوم نعناع‌فلفلی که از نقاط مختلف کشور جمع‌آوری شده بود، به صورت ردیفی کشت شدند. وقتی که گیاه به مرحله ۵۰ درصد گلدهی رسید از هر کرت به طور تصادفی ۵ بوته انتخاب و تاثیر روش‌های مختلف خشک کردن گیاه (سایه و آون با دمای ۴۰ درجه‌ی سانتی‌گراد) بر میزان عملکرد اسانس بررسی شد. اسانس‌گیری با استفاده از دستگاه کلونجر به روش تقطیر با آب در شرایط کاملاً یکسان انجام گرفت. برای اندازه‌گیری درصد اسانس، اسانس حاصل استخراج گردید و درصد آن بر اساس مقدار اندام هوایی پودر شده و میزان اسانس محاسبه گردید. اسانس‌های جمع‌آوری شده در داخل میکروتیوپ ریخته شد و در یخچال با دمای چهار درجه به دور از هوا و نور قرار گرفت. آنالیز آماری داده‌ها با استفاده از نرم افزار SPSS مورد تجزیه و تحلیل قرار گرفت. تجزیه واریانس و مقایسه میانگین بین صفات با استفاده از نرم افزار SPSS16 انجام شد.

نتایج و بحث:

نتایج بررسی تجزیه واریانس توده‌های نعناع‌فلفلی نشان داد که صفت میزان اسانس در مرحله ۵۰ درصد گلدهی خشک شده به روش سایه در سطح احتمال ۱ درصد معنی‌دار و صفت میزان اسانس در مرحله ۵۰ درصد گلدهی خشک شده به روش آون در سطح احتمال ۵ درصد معنی‌دار است (جدول ۱). همچنین نتایج مقایسه میانگین نشان داد که بیشترین میزان اسانس به روش خشک شدن در سایه ۰۶/۲ درصد و در گیاهان توده فیروزآباد و کمترین میزان اسانس ۴۴/۰ درصد در توده تبریز مشاهده شد. در مقابل آن بیشترین میزان اسانس ۱۲/۲ درصد به روش خشک شدن در آون در توده تبریز و کمترین میزان اسانس ۵۲/۰ درصد در توده فیروزآباد مشاهده شد (جدول ۲). میرزا و همکاران (۱۳۸۹) در تحقیقی به جهت تأثیر زمان برداشت بر کمیت و کیفیت اسانس نعناع‌فلفلی و مریم‌گلی (*Salvia officinalis*) پرداختند. بررسی نتایج کمی اسانس (بازده نسبت به وزن خشک) نعناع‌فلفلی نشان داد که برای دستیابی به بالاترین مقدار اسانس، بهتر است در مراحل قبل از گلدهی و بعد از گلدهی از گیاه برداشت صورت نگیرد. مرحله‌ای از گلدهی که حدود ۵۰ درصد از گل‌ها باز شده‌اند بهترین زمان برداشت گیاه است.

جدول ۱. تجزیه واریانس توده‌های نعناع‌فلفلی ایران.

میانگین مربعات			منابع تغییرات	درجه آزادی
میزان اسانس ۵۰	میزان اسانس ۵۰	درصد آون		
۲/۹۰**	۰/۰۰۹ns		۲	بلوک
۰/۶۱*	۰/۵۴**		۱۱	ژنوتیپ
۰/۲۰	۰/۱۲		۲۲	خطا

ns: به ترتیب عدم معنی‌داری، معنی‌داری در سطح احتمال ۱ درصد و ۵ درصد.

جدول ۲. مقایسه میانگین توده‌های مختلف نعناع‌فلفلی ایران.

توده	میزان اسانس ۵۰ درصد	میزان اسانس ۵۰ درصد آون
اردبیل	۱/۰۶bc	۰/۸۷ab
همدان	۰/۷۷bc	۱/۲۰ab
کردستان	۰/۷۶bc	۰/۶۹ab
گلستان	۱/۳۳b	۰/۹۲ab
مشگین‌شهر	۱/۴۲ab	۰/۵۸ab
فیروزآباد	۲/۰۶a	۰/۵۲b
نورآباد	۱/۳۶b	۰/۶۱ab
زنجان	۰/۷۷bc	۰/۵۴ab
تبریز	۰/۴۴c	۲/۱۲a
ارومیه	۰/۹۶bc	۰/۷۲ab
شیراز ۱	۰/۹۲bc	۱/۲۵ab
شیراز ۲	۱/۰۱bc	۰/۷۱ab

میانگین‌های با حروف مشابه در هر ستون از لحاظ آماری اختلاف معنی‌داری با یکدیگر ندارند.

تجیه گیری:

با توجه به وجود تنوع در بین توده‌های نعناع‌فلفلی موجود در کشور لازم است، این تنوع بررسی شده و در برنامه‌های اصلاحی به کار گرفته شود. در این پژوهش ۱۲ توده نعناع‌فلفلی از لحاظ صفات فیتوشیمیایی مورد بررسی قرار گرفت. نتایج نشان داد که تنوع ژنتیکی بالایی بین توده‌های نعناع‌فلفلی از لحاظ تنوع درصد اسانس وجود دارد. از لحاظ صفات بررسی شده فیتوشیمیایی توده‌های نعناع‌فلفلی ایران بر طبق تجزیه واریانس و مقایسه میانگین تنوع گسترده‌ای را نشان داد که در برنامه‌های اصلاحی می‌توان استفاده کرد. همچنین با توجه به نتایج بررسی تاثیر زمان برداشت و روش خشک کردن بر میزان اسانس که شامل روش‌های خشک کردن به روش سایه، خشک کردن به روش آون و زمان برداشت گیاه در مراحل نیمه گلدهی بر میزان عملکرد اسانس بود، نشان داد که بیشترین درصد اسانس جمع‌آوری شده از گیاه نعناع‌فلفلی در زمان برداشت گیاه در مراحل نیمه گلدهی و خشک شدن به روش سایه و در توده فیروزآباد به‌دست آمد.

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Microbial pigments in food industry

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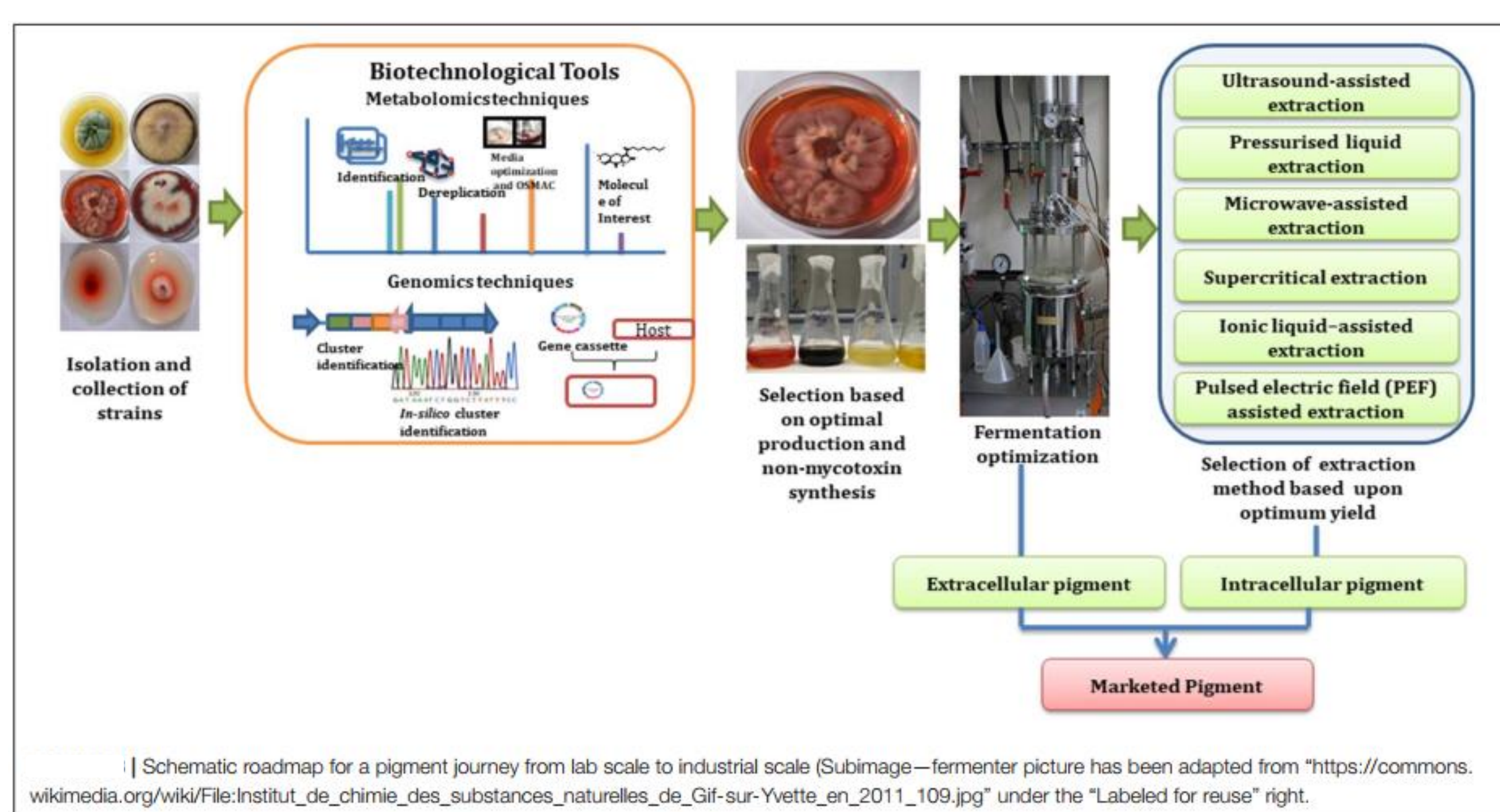
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Synthetic pigments have low safety and cause some risks to human health. Today, the Food and pharmaceutical industries need new pigments strongly, which must be natural, safe, and healthy pigments. Natural pigments are produced from microbes, plants, and microalgae. Natural pigments such as carotenoid, azaphilone, anthraquinone, phycoerythrin, lutein, zeaxanthin, isorenieratene. Microorganisms that produce pigments such as *Agrobacterium* spp, *Serratia marcescens*, *Cyanobacteria* spp, *Penicillium oxalicum*, *Plasmodium* spp. Carotenoids, naphthoquinone, and Violacein have antioxidant activity. *Streptomycin* produces colored natural antibiotics against human pathogenic microorganisms. aquatic *cyanobacteria* produce an Anti-cancer agent called Scytonemin, a yellow-green pigment that inhibits the proliferative cell. carotenoids produced by microorganisms enhance immune response (1).

Filamentous fungi are a natural pigment-producing agent. Filamentous fungi, especially ascomystose and basidiomystose fungi (mushrooms) and lichens (a symbiotic relationship between a fungus and a green algae or cyanobacterium) produce an extraordinary range of colors, including several chemical classes of well-known pigments such as melanin, azaphyllone, flavin, phenazine and quinine, which are suitable green substitutes for current sources (2).

The stability and progress of mushroom-based pigment industry mainly depends on three important factors (a) absence of mycotoxins in fungal pigments (b) pigment performance (c) stability and purity of pigment. Pigment-producing fungi are known to synthesize some toxic metabolites known as mycotoxins along with pigments and require approval through regulatory agencies. One of the main challenges in the production of fungal pigments is the production with high efficiency, for this purpose, the optimal conditions for the combination of culture medium, temperature, aeration and pH are determined. The cost of consumable culture medium is also valuable the cheaper it is, and if it is from waste, the costs are greatly reduced. Another important challenge is the stability of natural pigments against environmental factors such as pH, light, humidity, temperature and food matrices. Pigments stabilizing springs include: freeze drying, spray drying, emulsion and coservation. It is spray drying and significantly increases the shelf life of the product (3).



According to the properties of the microbial pigment such as natural, eco-friendly, and healthy compounds, antimicrobial, anticancer, immunoregulation, and anti-inflammatory, the production of microbial pigment has been considered. The production of microbial pigments in optimal bioreactors with low-cost substrates is very suitable and cheaper than chemical methods. In the future, more microbial pigments will be discovered, which will focus more on their beneficial and structural properties of microbial pigments.

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Antimicrobial compound from filamentous fungi

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Secondary metabolites produced by filamentous fungi have attracted attention. One of the most important secondary metabolites of filamentous fungi is a new-generation antibiotic. At the first time, Alexander Fleming discovered the antibiotic penicillin in 1928. The increase in multi-drug resistance (MDR) causes a great need for new-generation antibiotics. *Enterobacteriaceae*, vancomycin-resistant enterococci, and methicillin-resistant *Staphylococcus aureus* (MRSA) are an example of resistant bacteria and are difficult to treat. Mycelium and culture fluid of filamentous fungi contain antibiotics. Cephalosporin and penicillin are common antibiotics that are derived from *A. chrysogenum* and *Penicillium chrysogenum*. Respectively Cyclosporin A and Griseofulvin are produced from *Tolypocladium inflatum* and *Penicillium patulum*. Lindgomycin was produced by marine and terrestrial filamentous fungi of the *Lindgomycetaceae* family, which have antibacterial and antiviral properties and is against *Candida albicans* and MRSA (1, 2).

22% of antibiotics are produced by filamentous fungi (Include the penicillins, cephalosporins, clavulanic acid, and the carbapenems). Genomes of filamentous fungi contain silenced genes for antibiotic production. According to calculations, only 5% of the potential of filamentous fungi for antibiotic production has been discovered. Filamentous fungi that grow in extreme environments are the best candidates for the production of new generation antibiotics. the genomes of three fungi, the cold-loving (*Pseudogymnoascus pannorum* and *P. destructans* and the thermophilic *Thermomyces lanuginosus*) have gene clusters for antibiotic production. Due to the cultivation of extremophile fungi under normal conditions in the laboratory, to find the antibiotic production capacity of these fungi, their genomes should be studied with metagenomics (3).

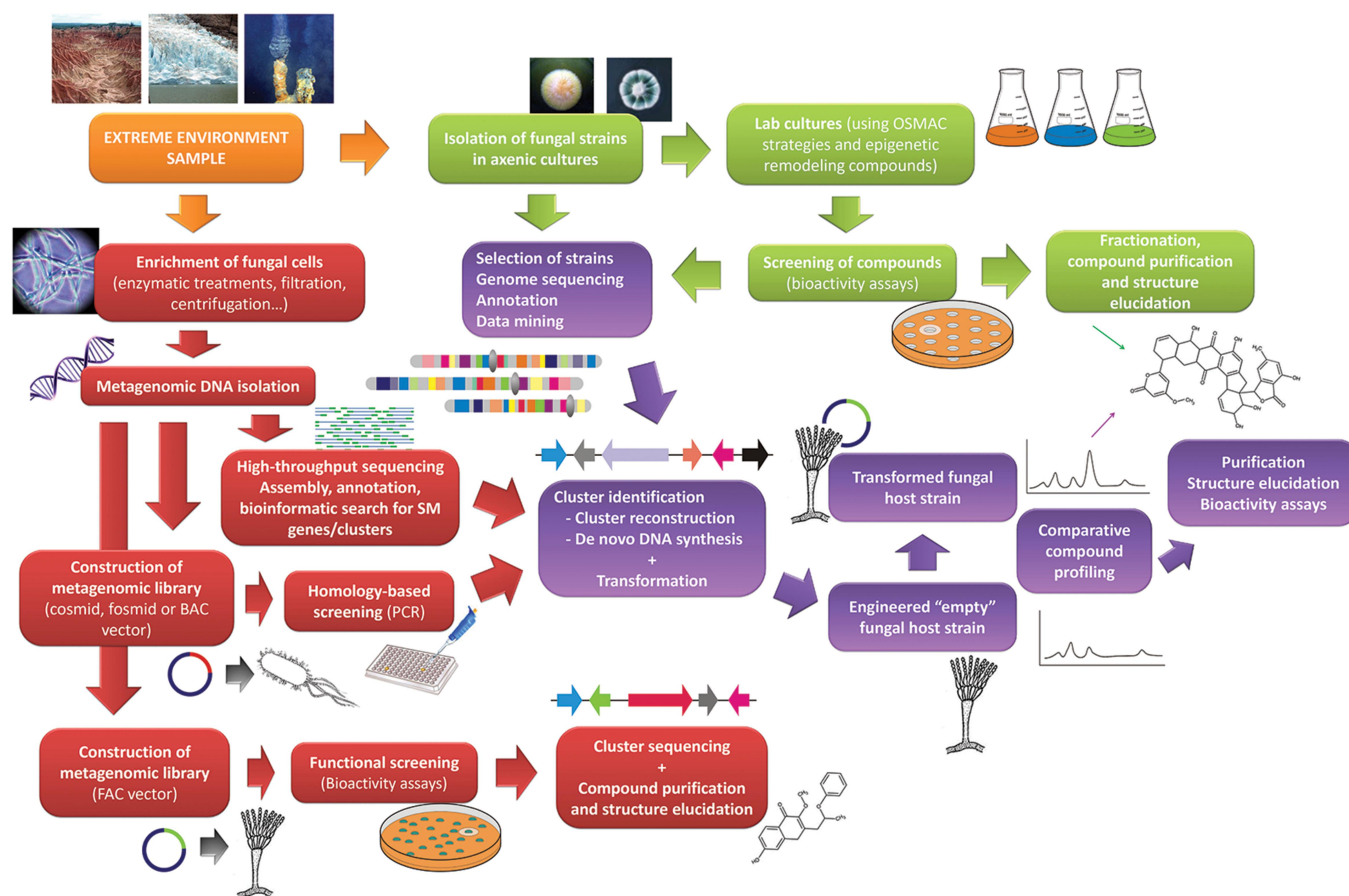


Figure 1. flowchart describing the main steps in different approaches to search for new bioactive compounds from extreme environment fungi (3).

Filamentous fungi contain novel cluster genes that express new bioactivities compounds such as antibacterial, antiviral, and antifungal compounds. According to filamentous fungi, they have a lot of decomposition enzymes and grow on a lot of cheap substrates, and they are very cheap to cultivate. In the environment, there are new filamentous fungi with new valuable metabolites that must be further researched.

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The effect of honey, royal jelly and propolis on Alzheimer's disease

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Statement of Problem: Alzheimer's disease is the most common cause of dementia. This disease is related to the involvement of the central nervous system and causes disturbances in nervous features such as memory, cognitive defects and behavioral abnormalities. Cognitive abnormalities caused by Alzheimer's are related to extracellular accumulations of amyloid beta plaques and neurofibrillary tangles consisting of intracellular hyper-phosphorylated tau proteins. Due to the lack of successful treatment and prevention of Alzheimer's disease with drugs, extensive efforts have been made to find new alternative ways for prevention, control and treatment this disease. Protective and preventive measures for Alzheimer's disease include social-intellectual activities, use of probiotics and foods containing bioactive molecules.

Research Purpose: The purpose of this study is to evaluate scientific reports about the effects of honey, royal jelly and propolis on the power of memory and learning in Alzheimer's patients.

Research Method: This study is based on the review of several articles.

Results and Conclusion : The evaluation of many scientific documents indicates that honey, royal jelly and propolis as suitable natural products that are produced by bees have short-chain fatty acids, flavonoids, phenolic compounds, antibacterial compounds and other useful compounds that play a role in maintaining human health, regulating immunity and memory. Some of these compounds, have anti-inflammatory, antioxidant properties that improve the memory by exerting positive effects on neurological functions. By treating or preventing some neurological disorders, can improve cognitive processes and cause significant improvement in learning and memory in Alzheimer's patients.

Besides anti-inflammatory and antioxidant properties, which all three products produced by honey bees have, royal jelly also has neuroprotective and anti-neurodegenerative properties in Alzheimer's disease. So, it can be more useful in improving the memory in patients with Alzheimer's disease.

Type of bee product	Bioactive compounds	Health benefits
Propolis	Phenelic compound, Terpenoid, Flavonoid	Anti-inflammatory, Antioxidant
Honey	Flavonoid, phenolic acid	Anti-inflammatory, Antioxidant, Neuroprotective
Royal jelly	Phenelic compound, Flavonoid, Acetylcholine	Anti-inflammatory, Antioxidant, Immunomodulatory, Anti-neurodegenerative, Anti-aging, Neuroprotective effect

Table 1. bioactive compounds in honey, propolis, and royal jelly.

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Introduction:

Plants have a great importance in our lives, and medicinal plants can provide a wealth of antimicrobial agents. Anthocyanins are polyphenolic secondary metabolites that have been shown to exhibit a variety of biological functions, including anti-oxidant, immune-modulatory, anti-tumor, anti-inflammatory, and anti-bacterial effects. Staphylococcus aureus is commonly responsible for major bone and joint infections and can cause a wide range of illnesses.

Non-growth halo of anthocyanin extracted from jujube



disc	consistenc y	Halo growth
Methanol	30%	Negative
Ethanol	30%	Negative
Distilled water	—	Negative
Jujube extract		Negative
Jujube extract		Positive
Jujube extract		Positive

Methods:

We used the homogenize, water, and ethanol techniques to extract the anthocyanin-containing extract in order to examine the anthocyanin's properties. Escherichia coli and Bacillus subtilis were used in the antibacterial assay of barberry extract products. We use Luria-Bertani Agar medium for this experiment, which contains 1.5 g of agar, 0.5 g of yeast, 1 g of NaCl, 1 g of tryptone, and 100 ml of distilled water. The diameter of the growth inhibition zone of products containing barberry extract was determined following an 18-hour incubation period in bacterial culture. An uncontaminated area around the bacterium shows that the antibiotic therapy has successfully stopped or inhibited microbial growth.

Result

The inhibition zones were 19 and 25 mm for two concentrations (7 and 14 μ M) of jujube extract against S.aureus, respectively, implying that jujube extract can inhibit S.aureus growth effectively on-growth halo of anthocyanin extracted from jujube.

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Microbial levan and its healing effects

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Statement of Problem

In recent years, several researches have been conducted for the bioproduction of microbial extracellular polysaccharides and their role in the ecosystem for more environmentally responsible products. In turn, this has prompted manufacturers to seek renewable raw materials with a good safety profile. Levan is one of microbial extracellular polysaccharides. Microbial levan has a wide range of applications in the food, pharmaceutical, cosmetic and commercial industrial sectors.

Research Purpose

Investigating the production of microbial levan as a bioactive compound and its healing effects.

Research Method

This research has been done in a systematic way.

Results and conclusion

Levan is an extracellular amphiphilic homopolysaccharide with a furanose structure. Levan is a polymer of fructose units connected by β -(2,6) links, and each chain is connected to a β -D-glucose unit at its end. The main chain is branched through β -(2,1) linkage of the fructofuranosyl rings.

In nature, a variety of microorganisms and a limited number of plant species have the ability to produce levan from sucrose. Microbial levan is composed of large numbers of fructofuranosyl units and has a high molecular weight. It is packed into nano-sized, spherical forms, providing

it with a remarkably low intrinsic viscosity which allows this extracellular polysaccharide to be widely used in biotechnology. This compound is soluble in water and has high thermal resistance. levan is usually synthesized from sucrose, syrups or molasses.

Bacterial fructosyltransferase or levansucrase when the polymerization product is levan, is capable of directly converting sucrose into highly polymerized fructans.

At the end of fermentation of levan, the enzyme must be inhibited promptly otherwise depolymerization quickly decimates levan. In addition, the downstream processes make it difficult to produce Levan on an industrial scale. For example using a dialysis bag for separation or lyophilization is inefficient on an industrial scale. The conventional methods used for drying in the industry, such as spray drying, reduce the purity of the resulting levan due to adhesive strength of levan and the need to use carriers. There have been methods to improve the production of Levan including optimization of fermentation conditions, genetic engineering methods, and adaptive lab evolution.

Biocompatibility, biodegradability and renewability are the general properties of Levan. To activate metalloproteins, levan can be used in various ways in the treatment of wounds. Levan may act by directly reducing the processes involved in stimulating leucocytes to adhere to the blood vessel walls, thus anti-inflammatory effects. Levan are used as an inhibitor of smooth muscle proliferation and as an anti-AIDS agent. Anticancer effects reported for Levan have been related to raising caspase activity and effective radical scavenger. The anti-inflammatory properties of levan are related to interferon responses. It has also shown anti-bacterial and anti-viral effects. Adding levan to the diet can contribute to weight loss by increasing the mRNA expression of UCP protein and reducing blood cholesterol by reducing the absorption of sterols. Levan also has prebiotic effects because it is converted into an indigestible fructo-oligosaccharide under acidic conditions, which does not have toxic or allergic effects. By reducing stomach acidity, Levan reduces beta-glucuronidase activity, as a result, the amount of short-

chain fatty acids increases, which subsequently increases the population of lactic acid bacteria and protects the intestine from carcinogenic substances.

In addition to the mentioned cases, Levan can be used in other industries including the beverage industry as a sweetener, dietary fiber, emulsifier and flavor enhancer. It can also act as a natural surfactant and is widely used in the cosmetic industry in the preparation of skin creams, moisturizers, hair conditioners, and etc. Levan is used in the pharmaceutical, medical and nanotechnology industries, in the purification of materials through a two-phase system, in drug delivery systems and nanostructured films.

For more than hundreds of years, various applications have been identified for this polysaccharide; But only a few of them have been industrialized. therefore, the need for a better and deeper understanding of the mechanism involved in the synthesis and extraction of microbial extracellular polysaccharides such as Levan is necessary for their cost-effective production on a large-scale. Integrating systems biology with current research on levan provides a deeper understanding of levan biosynthesis and related mechanisms.

Keywords

Levan, Exopolysaccharide, Polyfructane, Biopolymer.

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Commercialization of phage products: An aperture to new opportunities

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Statement of Problem: In recent years, the prevalence of antibiotic-resistant bacteria became a major issue in medicine. Therefore, alternative therapeutics like lytic bacteriophages have been commenced to tackle this trouble.

Research Purpose: This study has been focused on overviewing the commercialization status of single phage formula versus phage cocktails and phage encapsulation in medicine and industry.

Data Collection: Google Scholar, PubMed, and Google patent have been overviewed and FDA-approved encapsulated phage cocktails discussed here.

Results and Conclusion: In spite of single phage, phage cocktails destroy a wide range of pathogens, improve therapy, reduce the probability of emerging phage-resistant mutant bacteria, and increase the success in phage therapy. Technically, the encapsulation of bacteriophages in the pharmaceutical industry provides optimal posology, protects bacteriophages against the gastric acidic pH, and improves their stabilization and long-term storage. In this line, the accrual production of commercial products around the world made the Food and Drug Administration (FDA), and United States Environmental Protection Agency (USEPA), provide a regulatory pathway for the production of products containing phage cocktails and the use of lytic bacteriophage encapsulation techniques. In this context, a cocktail phage (SalmoFresh®, American company Intralytix) approved against pathogenic *Salmonella* serotypes in food products. Phagex company in Ukraine has offered products containing phage cocktails (Pyofag® and Intestifag®) to treat enteric diseases. In addition, an encapsulated bacteriophage (Mediphage®, Aziya Immuno-preparat Co. Uzbekistan) against *Shigella* has been marketed. Accordingly, phage encapsulation in the pharmaceutical industry and edible solid products maximizes the oral potency of grafting high-performance phages in patients and leads to bioconservation of gut microbiota in health and diseases.

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The use of encapsulation technique in the formulation of bacteriophages

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Statement of Problem: The emergence of multi-drug resistant bacteria through random mutation and genetic transfer is an evolving phenomenon with wide-reaching consequences. Therefore, new strategies, including the potential use of lytic bacteriophages, have been considered for targeting bacterial infections.

Research Purpose: Recently, several phase I and II clinical trials of phage therapy have succeeded. With the progress of phage therapy toward phase III clinical trials, several strategies based on the encapsulation of bacteriophages to produce phage formulations have been considered.

Research Method: The research method involved searching the Science Direct, PubMed, and Google Scholar databases.

Results and Conclusion: The formulation of bacteriophages, encapsulated by spray and freeze-dried powders, emulsions and liposomes, leads to the use of phages in semi-solid, edible products, and improvements in phage stability during the formulation process. Based on the experiments, the lytic activity of bacteriophage k against *Staphylococcus aureus* in the form of nano-emulsion leads to the use of topical formulations to improve skin infections caused by *Staphylococcus aureus*. Also, the stability of bacteriophages PEV2 and PEV4 against *Pseudomonas* using the Spray-Drying technique showed a 1-log drop in titer after one year at 20°C. Moreover, the formulation of bacteriophages using cationic hydrogels, liposomes, and alginate polysaccharide causes the penetration of phages into bacterial biofilms and the release of active phage particles to reach the site of infection in the long term and prevents inactivation by the acidic pH of the stomach. As a result, more research on the formulation of bacteriophages requires serious attention in terms of the ease of increasing production and alternatives to antibiotics.

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Fetus preservation drugs from the perspective of Persian medicine

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Statement of Problem & Research Purpose:

Miscarriage is a common complication of pregnancy and means the termination of pregnancy before the 20th week, either spontaneously or intentionally, before the fetus has reached sufficient development to continue life.(1) In all kinds of complementary medicine, there are many methods to prevent this complication, including the methods mentioned in authentic books of Persian medicine, to preserve pregnancy and fetus and prevent abortion, which in this study, introduced herbal medicines, which preserve the fetus and prevent abortion, have been discussed.

Research Method:

This study is a review study with reference to the authentic texts of Persian medicine, such as Ibn Sina's The Canon of medicine, Teb Akbari, Al-Shamil fi sanaat tebbia, Tohfa Al-Mominin, Elixir Azam, Makhzan Al-Adwieh, etc.



Results and Conclusion:

In the sources of Iranian medicine, a variety of treatments, including single or combined drugs, and how to use them to prevent abortion and preserve the fetus are mentioned. Some items available in Iranian medical books (for each person according to her temperament or the causes of previous abortions) Indicated orally, are grapes, unripe grapes sauce(2), quince (in the form of jam and decoction), pear, pomegranate, raisins(3), almond gum, oud wood and topically sitting in the decoction of some drugs such as Myrtus communis, Punica granatum, lentils(4) and Vaginal use of lapis lazuli along with olive oil(5) is mentioned. Also, there are many combined drugs that prevent miscarriage, such as apple syrup with Citrus medica(6), various types of mufarrah drugs(4), a combination of rose and rose water(7), the compounds containing pearls and mastic(6), etc.

By taking advantage of the tadabir and medicines that are widely mentioned in Persian medicine, it is possible to guarantee the health of the uterus and then the health of the fetus and the prevention of abortion.

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The effect of an oral product containing Amla fruit (*Phyllanthus emblica* L.) on female androgenetic alopecia: a randomized controlled trial



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Statement of Problem: Androgenetic alopecia is one of the most common causes of non-scarring hair loss in women. Amla (*Phyllanthus emblica*) fruit is a remedy that has been emphasized as a hair strengthener in traditional Persian medicine (TPM) and recommended for hair loss.

Research Purpose: The aim of this study was to investigate the effect of an oral product containing Amla fruit on female androgenetic alopecia (FAGA).

Research Method: This study was designed as a triple-blind randomized controlled clinical trial. Sixty women with FAGA were randomly assigned into two groups of thirty. The intervention group was received 10 cc Amla syrup, three times a day for 12 weeks. The control group received placebo with the same dose and duration. Hair growth parameters were analyzed using TrichoScan before and after 12 weeks of intervention. Physician and patient satisfaction were assessed using the CGI-I and PGI-I questionnaires, respectively.

Results and Conclusion : Twenty-seven participants in the intervention group and 25 in the control group completed the trial. Based on our findings, the anagen-to-telogen ratio increased significantly in the intervention group compared with the control group who received placebo ($F=10.4$, $P=0.002$). Physician and patient satisfaction increased in amla group compared with placebo at 12th weeks of intervention ($P<0.001$), ($P<0.001$). The formula had no remarkable side effect. Only one case of mild constipation was reported in one of the participants after one month of consuming Amla syrup.

The results of this study demonstrated that Amla syrup could help treat androgenic hair loss in women and increase the anagen phase. Further studies are needed to evaluate this potential treatment for FAGA



Keywords: Gooseberry, Traditional Persian Medicine, herbal medicine, hair loss, androgenic alopecia

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Brain-friendly metabolites from microscopic world

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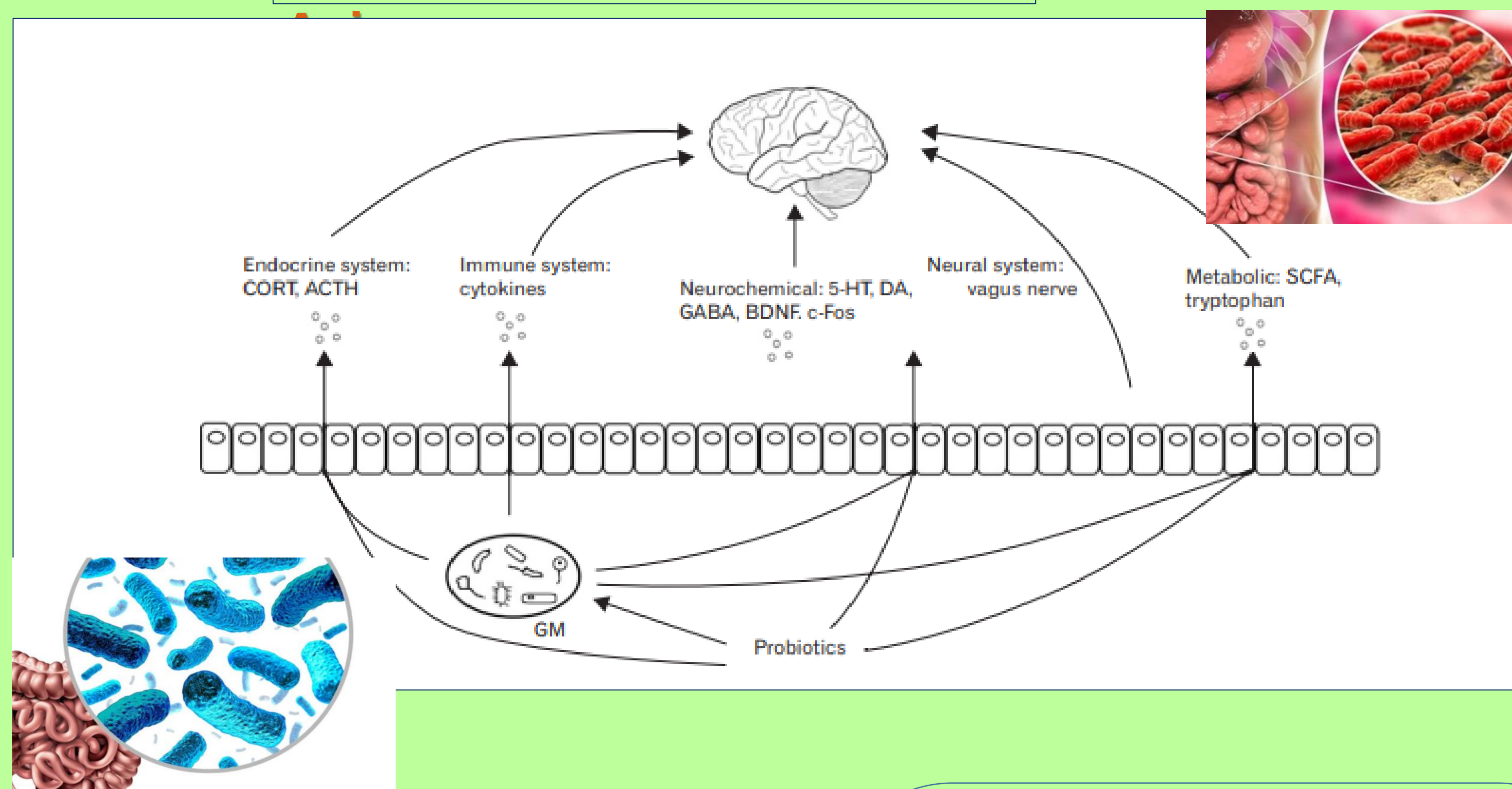
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Mechanisms of probiotic effects on the central nervous system

Probiotics influence central nervous system (CNS) function through direct and indirect mechanisms. Probiotics affect the hypothalamic-pituitary-adrenal (HPA) axis, by altering corticosteroid (CORT) and/or adrenocorticotrophic hormone (ACTH) levels. The immune system is influenced by limited pro-inflammatory cytokine production and inflammation, and this, in turn, has effects on the CNS. Probiotics can also directly alter CNS biochemistry, such as by affecting brain-derived neurotrophic factor (BDNF), c-Fos, γ -aminobutyric acid (GABA), 5 hydroxytryptamine (5-HT), and dopamine (DA) levels, thus influencing mind and behavior. The vagus and enteric nerves are also involved in this gut-brain interaction and are affected by certain probiotics. Probiotics manipulate the gut microbiota (GM) by increasing microbiota diversity and beneficial bacteria composition. An "improved" GM changes metabolites, such as shortchain fatty acids (SCFAs) and tryptophan, and so improves CNS function indirectly. The GM also interacts with the endocrine, immune, and neural systems.

The Brain- Gut- Microbiome



Probiotics

Definition in 2014

EXPERT CONSENSUS DOCUMENT

The International Scientific Association for Probiotics and Prebiotics consensus statement on the scope and appropriate use of the term probiotic

"live microorganisms that, when administered in adequate amounts, confer a health benefit on the host"

Hill C et al (2014) Nat Rev Gastroenterol Hepatol 11:506–514.

Postbiotics as beneficial metabolites produced by probiotics

Also known as metabiotics, pharmacobiotics, or heat-killed probiotics are bioactive compounds produced by the metabolism of probiotics, mainly lactic acid bacteria (LAB). Several compounds found in probiotics are released into the environment before death and are also considered postbiotics such as Enzymes, polysaccharides, organic acids, short-chain fatty acids (SCFA), cell surface proteins, vitamins and lipids.

Neuroprotective Effects

- The Interaction of probiotic metabolites with blood brain barrier (BBB)
- Sending signals to the CNS through producing compounds such as gamma amino butyric acid (GABA) & tryptophan products with specific role in regulating their communication pathway, the gut brain axis.
- Single or consortia of probiotics with the most effects on preventing inflammation, improving immunity and neuroprotection.

Probiotic formulas with benefits for mental health and metabolic function, alleviating symptoms of neurodegeneration and cognitive disorders, protecting neurons from oxidative stress and apoptosis are the goal of investigations. The results are promising but more research is needed on the effector molecules produced by these beneficial microorganisms and their interactions with the central nervous system.

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Royal jelly and pollen as functional foods for human

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Abstract

Bee pollen and RJ is currently used as a functional food or supplementary nutrition in some countries including, China, Chile, Portugal, Australia, South Africa, Brazil and the Sonoran Desert, USA. Royal jelly (RJ) is a bee product secreted from the hypopharyngeal and mandibular glands of young worker honeybees (*Apis mellifera*) and involved in their sexual determination. Royal jelly is one of the most interesting natural products. Pollen has been used as a “perfect health food” for many centuries due to its abundance of nutrimental constituents and bioactive compounds. Pollen is the male gametophyte of flowers. The protein content of pollen is believed to be one of the best indicators for nutritive quality. RJ and pollen contains bioactive compounds with health-promoting properties. They are promoted as a health food with a wide range of nutritional and therapeutic properties.

Functional properties of RJ and pollen include the following: antioxidative activity, Insulin-like action, antitumoral action, neurotrophic action, antibiotic effect, anti-inflammatory action and wound healing effect, hypotensive and blood regulatory actions, anti-aging effect and skin protection, effects on the reproductive system and fertility, fortifying and tonic action and immunomodulatory and anti-allergic activity. Though in Iran there are not insufficient studies in this area.

The purpose of the current research is to determine the main components, physico-chemical properties and healing properties of RJ and pollen and their application as functional and nutraceutical food.

Keywords: Royal jelly, pollen, functional food, Human.

1. Introduction

Royal jelly (RJ) is a secretion produced by the hypopharyngeal and mandibular glands of worker honeybees (*Apis mellifera*). This secretion is produced in the worker bees' stomach by the incomplete digestion of honeydew. Pollen is the male gametophyte of flowers. Bee pollen is plant pollen collected from different sources by the worker honeybee *Apis mellifera* feeding its larvae in the early stages of development. Collected flower pollen is accumulated as corbicular pellets in pollen baskets on the rear legs of the honey bee and it is a mixture of these pellets that comprises bee pollen (Krell, 1996; Campos, 1997; Almeida-Muradian et al., 2007). When visiting flowers, bees touch the stamens and their bodies become covered with pollen dust. The bees use their hind legs to compress the pollen into the pollen baskets. The bees moisten the pollen with mouth secretions which help the pollen to cling together and to the basket hairs (Hodges, 1952; Barth and Luz, 1998; Dutra and Barth, 1997; Krell, 1996; Luz and Barth, 2001). These secretions contains different enzymes, e.g. amylase, catalase etc. A pollen load contains up to 10% nectar, which is necessary for packing. The production of bee pollen might help to increase economic profits and thus help beekeepers to rectify their financial difficulties. RJ is a part of the diet of honeybee larvae and it plays a major role in caste differentiation (Moritz and Southwick, 1992). For up to 3 days, the larvae are supplied with RJ. Thereafter, only larvae designated to become queens receive RJ, while a mixture of honey, pollen and water is fed to larvae selected to become workers (Drapeau et al., 2006). It is known that the honeybee queen lives for several years compared to a few months for the worker bee (Krell, 1996). Royal jelly has been known about for ages, but has only been available in the last 50-60 years in quantities large enough for human consumption. China is the largest producer and consumer of RJ. A functional food is a **food** given an additional **function** (often one related to general health-promotion) by adding new ingredients or more of existing ingredients; but nutraceutical, a portmanteau the words “nutrition” and “pharmaceutical”, is a food or food product that provides health and medical benefits, including the prevention and treatment of disease. Royal jelly and pollen, because of their bioactive compounds, are known as functional and Nutraceutical foods; this means that not only they enhance the overall health of the body, but also improve some diseases.

Bee pollen and RJ is currently used as a functional food or supplementary nutrition in some countries including, China, Chile, Portugal, Australia, South Africa, Brazil and the Sonoran Desert, USA. The present article aims to present a brief review of research studies on physicochemical properties and biological activities of RJ and pollen and their application as functional and Nutraceutical food.

2. Physicochemical properties

2.1. Physical Properties
RJ is a thick and milky substance which is partially soluble in water, with a density of 1.1 g/mL. It have a sharp smell, pungent odour and fruity or somewhat bitter taste and is nutritionally abundant. Its colour is whitish to yellow, the yellow colour increases upon storage. (Haydak, 1970, Isidorov et al., 2009). Pollen grains range in size from 10 to 150 µm and are protected by a chemically resistant outer layer, the exine. Because pollen grains of many plant families are different morphologically, they can be recognized by their distinct shape, size, colour, sculpturing, and number of apertures (Punt et al., 2007). Colour of pollens varies from white to black, mostly yellow, orange or yellow-brown, but many different colours are possible according to the floral sources (Hodges, 1952). Pollen grains are protected by a remarkably complex and robust wall with two layers known as the “intine” and “exine.” The intine, composed of cellulose and a few other polysaccharides, is the innermost of the major layers, underlying the exine and bordering the surface of the cytoplasm (Punt et al., 2007). It is divided into two sublayers: endintine is the inner thicker layer adjacent to the cytoplasm and of cellulosic character; exintine, the outer, thinner layer, stains positively for pectin. Odour of pollens varies according to floral sources and its taste is specific, sweet, sour, bitter, spicy.

2.2. Chemical composition
The water content is fairly uniform at greater than 60%, and with an activity (aw) above 0.92. The dry matter of RJ is composed of protein (27-41%, including free amino acids), carbohydrates (approximately 30%), lipids (8-19%), trace elements and some vitamins (Sabatini et al., 2009). RJ has a high acidity (pH 3.4–4.5) (Lercker, 2003).

Monofloral pollen is standard quality pollen with minimal variations, obtained by collecting bee pollen from single botanical taxa; its composition varies with the plant source and geographic origin. Monofloral pollen ensures uniform biochemical and organoleptic characteristics to that of the original plant, while heterofloral pollen exhibits variable properties.

The exine (outer layer of pollen, key and distinguishing feature of pollen grains) is made of sporopollenin, a complex polymer (a β-carotenoid ester) resistant to all but the most extreme oxidizing or reducing agents. Thus, the organic or inorganic matrix in which the pollen grains are trapped can be removed by chemical means without destroying the pollen itself (Cushing, 1967). Sporopollenin is composed of carbon, hydrogen, and oxygen and its stability is illustrated by its being found intact in sedimentary rock some 500 million years old. In contrast to the intine, the sporopollenin exine is acetolysis resistant. Such stability is important in the preparation of microcapsules for food applications since all allergenic proteins, which may be present in the bulk pollen, can be removed readily and cheaply by harsh treatment with strong acid and base. Table 1 shows the main composition RJ and pollen. Table 2 shows the vitamins and minerals of RJ and pollen.

The values of composition obtained by the various authors are fairly in agreement, notwithstanding the high variability displayed for sugars and lipids. It should be kept in mind that RJ is naturally non-homogeneous, moreover the reported findings refer to different number of samples, places and times of production and that different methods of sampling and analysis were used. Analyses of RJ samples of different geographical origins showed that environmental conditions do not significantly influence the main components (Sabatini et al., 2009).

Table 1: the main composition of fresh and lyophilized RJ and pollen

Composition	fresh RJ	Lyophilized RJ	fresh Pollen (Maize)	Pollen (Mustard)	Pollen (dry weight)
water	50–70% 60-70%	<5%	45%	7.26%	5-6%
proteins	9–18%	27–41%	29.7%	18.2%	10-40%
carbohydrates	7–18% 7-23	22–31%	22.4%	56.06%	13-55%
lipids	3–8%	15–30% 8-22.5 %	13.9%	13.7%	1-13%
mineral	1.5% 0.8-3	2-5%	2.63%	2.57%	2-6%

Table 2: Minerals and vitamins RJ and pollen.

Minerals and vitamins	Pollen (mg/kg)	RJ (mg/100 g)
Potassium	4000-20000	200- 1000
Magnesium	200-3000	20-100
Phosphorus	800-6000	
Iron	11-170	1-11
Zink	30-250	07-8
Manganese	20-110	
Copper	2-16	0.33- 1.6
β- Carotene	10-200	
B ₁ (Thiamin)	6-13	
B ₂ (Riboflavin)	6-20	0.5- 2.5
B ₃ (Niacin)	40-110	4.5- 19
B ₅ (Pantothenic acid)	5-20	3.6- 23
B ₆ (Pyridoxin)	2-7	0.2- 5.5
C (Ascorbic acid)	70- 560	
H (Biotin)	0.5-0.7	0.15- 0.55
Folic acid	3-10	0.01-0.06
E (Tocopherol)	40-320	

3. Functional properties

It is supposed that royal jelly makes a balance in the human body. It might be because of a similar balance between its components which are mixed in a suitable proportion.

Functional properties															
Antioxidative activity	Royal jelly	protects tissue DNA against the oxidative damage: reducing in levels of oxidative stress marker (8-hydroxy-2-deoxyguanosine) in kidney DNA and serum by feeding RJ to mice													
	Pollen	Protective effects of pollen have been related to the content of Phenolic constituents (total phenols, phenylpropanoids, flavonols and anthocyanins). Phytochemicals, such as phenolic compounds are considered beneficial for human health since they decrease the risk of degenerative diseases by decreasing oxidative stress and inhibiting macromolecular oxidation.													
Insulin-like action	Royal jelly	RJ is anti-diabetic and prevents insulin resistance. Insulin-like peptides,chromium, sulphur, vitamins B3 in RJ can reduce blood sugar level. RJ takes part in the oxidation of glucose to obtain energy and sustains the optimal blood level of sugars. It exhibits Hyperglycaemic action. There is insulin in RJ very closely resembles the mammals insulin. RJ reduces alloxan induced diabetes which destructs insulin.													
	Pollen	A group of steroid hormones such as testosterone, epitestosterone, androstenedione and progesterone have been found in pollens. Hypoglycemic activity of pollen is mainly attributed to the presence of unsaturated fatty acids, phospholipids, and phytosterols.													
Antitumoral action	Royal jelly	10-hydroxy-2 decenoic acid (10HDA) is responsible for the antitumoral action. Two major proteins in RJ, apalbumin-1 and apalbumin-2, stimulate macrophages to release TNF-α (tumor necrosis factor). In patients with breast cancer, RJ stimulated the immuno globuline production by lymphocytes and increased IgM and IgG (the anti-cancer factors). The RJP30 proteic fraction plays an antitumoral role. RJ prevents the myelosuppression induced by tumor evolution (immunostimulating effect). RJ shows antiestrogenic activity by inhibiting the effect of bisphenol A (an estrogen which stimulates the MCF-7 mammary cancer cells proliferation)													
	pollen	The ability to reduce platelet clumping and increased fibrinolytic system activity was confirmed in people who take pollen. It shows the antiatherosclerotic effect which protects from heart diseases and brain strokes.													
Neurotrophic action	Royal jelly	RJ stimulates and activates central nervous system by Glial Cell-Derived Neurotrophic Factor. RJ increases the differentiation of brain cells from neural stem cells, RJ played neurotrophic and neuroprotective roles on the hippocampus of the adult mouse brain. RJ simplifies the differentiation of all types of brain cells: neurons, oligodendrocytes and astrocytes. Acetylcholine in RJ is a neurotransmitter in the peripheral and central nervous systems. It is only neuromodulator used in the motor division of the somatic nervous system. 10HDA increases the generation of neurons. AMP N1-oxid stimulates the formation of different brain cells and the expression of protein specific to mature neurons (neurofilaments-M) and stops the proliferation of PC 12 cells. RJ Reduces neuronal death and an increase of neurogenesis in Alzheimer's disease and Parkinson's diseases. It improves the spatial memory.													
	Pollen	Pollen collected by bees contains all nutrients which are necessary for plant growth and development and also targets the entire human body, which is a special boost to the nervous, reproductive and immune.													
Antibiotic effect	Royal jelly	Different compositions of RJ show antibiotic effects against microorganisms; The active substances of RJ are destructured during digestion and it cannot exhibit antibiotic and anti-inflammatory effects.													
		compositions	Microorganisms	10-hidroxi-α2-decenoic acid (HDA)	several fungi and bacteria and (such as <i>Neurospora sitophila</i> , <i>Micrococcus pyogenes</i> , <i>Escherichia coli</i>).	Royalisin protein	Gram-positive bacteria (<i>Lactobacillus helveticus</i> , <i>Clostridium</i> , <i>Corynebacterium</i> , <i>Leucnosc</i> , <i>Stafilococcus</i> , <i>Streptococcus</i>).	Jeleines -I, -II, -III	yeast, Gram positive and negative bacteria	Water soluble components (proteins and Peptides)	Gram positive bacteria and fungi	RJ and starch	<i>Streptococcus aureus</i> and <i>E. coli</i>	RJ and honey	<i>Staphylococcus aureus</i> and diabetic foot infection
		compositions	Microorganisms												
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		Jeleines -I, -II, -III	yeast, Gram positive and negative bacteria												
	Water soluble components (proteins and Peptides)	Gram positive bacteria and fungi													
	RJ and starch	<i>Streptococcus aureus</i> and <i>E. coli</i>													
RJ and honey	<i>Staphylococcus aureus</i> and diabetic foot infection														
Pollen	There are some reports about the antimicrobial activities of pollen. Bee pollen has recently received an increased attention for its antibacterial and antifungicidal effects.														
Anti-inflammatory action and wound healing effect	Royal jelly	The fatty acids and proteins of RJ and its antimicrobial properties, makes it appropriate for wound healing. It Improves regeneration of skin in wounds. MRJP3 of RJ suppresses the secretion of pro-inflammatory cytokines and activates keratinocytes, involved in wound healing. RJ reduces inflammation by hormone-like effects. 10-hydroxy-2-decenoic acid (10H2DA) and 10-hydroxydecenoic acid (10HDA) increase the collagen production. RJ shorts the healing period of desquamated skin lesions. By decreasing exudation, RJ increases wound healing capacity and collagen formation in granulation tissue formation. RJ causes wound healing by Inhibiting capillary permeability. RJ heals foot ulcers of diabetic patients.													
	Pollen	Bee pollen has been successfully used to treat some cases of benign prostatic. Bee pollen is used in the apitherapeutic treatment as it demonstrates a series of actions such as antiviral, anti-inflammatory and local analgesic and also facilitates the granulation process of the burn wound healing. Pollen is determined by a high anti-inflammatory activity. Its value is compared to such nonsteroidal antiinflammatory drugs as naproxen, analgin, phenylbutazone, or indomethacin.													

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Ameliorative role of turmeric curcumin as a natural antioxidant on phenol-mediated renal toxicity in rats

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Statement of Problem: The increasing role of phenol in many industries and its broad range of medicinal applications increase its potential toxic impacts. Also, its detrimental effect on the rat kidney has been investigated in a number of studies. On the other hand, curcumin is active ingredient of *C. longa* and has protective effects against a wide range of toxic agents.

Research Purpose: This study was conducted to examine the probable ameliorative impact of curcumin in attenuating phenol toxicity in rat kidney.

Research Method: Thirty-two animals were divided into four groups; control groups, curcumin group orally received curcumin 200 mg/kg bw, phenol group orally gavaged 180 mg/kg bw phenol and combined group orally gavaged curcumin and phenol. Treatment was given for 2 weeks. Blood samples were taken for biochemical analysis. Renal tissue samples were also collected to histopathological examinations.

Results and Conclusion:

Administration of phenol revealed elevation in serum creatinine and blood urea nitrogen levels, elevated renal injury as well as malondialdehyde levels and decreased superoxide dismutase activity. Combination use of curcumin and phenol improved most of the side effects in rats treated with phenol regarding oxidative stress and histological parameters in kidney.

This study shows that curcumin treatment ameliorates the toxicity in the kidney of phenol-treated rats through its antioxidant properties.

Keywords: Curcumin, Phenol, Renal toxicity, Histology, Rat.



Mitigation of arsenic driven ovarian toxicity by VenoVine® (*Vitis vinifera* L. extract) administration

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Statement of Problem: VenoVine®, as a mitigation agent, contains dry extract of red grape leaves and is a natural agent of increasing interest in the treatment of toxic compounds. On the other hand, arsenic, a toxic metallic element widespread in the environment, mediated female reproductive dysfunctions.

Research Purpose: This study aimed to examine the remedial potential of VenoVine® against arsenic-instigated ovotoxicity in adult female rats.

Research Method: To do this study, Wistar rats (N = 28) were randomly allocated into four groups: control group, arsenic (10 mg/kg) group, VenoVine® (100 mg/kg) + arsenic (10 mg/kg) group, and VenoVine® (100 mg/kg) group. After 45 days of treatment, biochemical assay, estrogen, progesterone, and LH levels, and also histopathological profile of ovarian architecture were estimated.

Results and Conclusion: Arsenic intoxicated group exhibited detrimental changes in the ovarian histo-morphology and also remarkable increase in the levels of estrogen and LH. Arsenic intoxication also accomplished with significant increase in the malondialdehyde along with decreases in the catalase and superoxide dismutase activities. Otherwise, VenoVine® treatment exerted its positive action against arsenic intoxication by decrease of malondialdehyde, increase of superoxide dismutase activity, and restoration of estrogen levels.

These results confirm protective effects of VenoVine® against arsenic.

Keywords: VenoVine® (*Vitis vinifera* L. extract), Arsenic, Ovary, Histology.

A review of the therapeutic application of honey bee products in history



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Abstract

Honey bee is one of the valuable insect that has some medicinal products which play special role in human health. Since many years ago, these products were familiar for the man that is mentioned honey, royal jelly and wax. Egyptian, Greeks and eastern countries such as Iran and China were the prior to using honey bee products for their curative properties. The term Apitherapy was created after knowing the role of bee products to increasing health and curing the illness. Before it, people thought apitherapy is just using bee venom but after 17th centuries the scientist described new world on applications of bee products. However, since past till now apitherpy is the used of all bee products solo or in combination with together for increasing human health. In this article, properties and history of important products of honey bee including honey, royal jelly, propolis, bee pollen and bee venom were described.

Introduction

Honey bee is one of the valuable insect that has some medicinal products which play special role in human health. One of them is honey, the most famous medicinal products of bees, has been important content in many tribes and religions since the past. In eastern traditional medicine, such as that which flourished in Iran, China, and India, the features of healing wounds, curing digestive diseases, increasing energy, and strengthening the body's powers, etc., have been mentioned from honey, royal jelly and bee pollen. Also, various tribes such as Maya in South America, Greece and ancient Egypt and other nations have mentioned honey bee products as a sweetener, treatment and even a tribute and a material for economic trade, which shows the value of these products.

Honey

Honey is high viscosity content and easy to eat, thus may have contributed to potential as nutrition and medicine for human's body.

The oldest manuscript to the use of honey for medicine is Egyptian of about 5500 BC. Honey bees draw in the temple and tomb art of Egypt as far back as 3100 BC. Temples kept bees to satisfy the desire of the gods for producing honey and for the medicinal aims such as producing ointments. Oil was mixed to river dust, honey, water, and other ingredients; this method was for external use, and some ancient peoples used honey with this recipe. One of the famous honey made compounds in eastern curative products was a mixture of honey, vinegar and water was called oxymel. According to Hippocrates, it was often very useful in acute diseases, for it promotes expectoration and breathing illness.

Royal jelly

Royal Jelly (RJ) is a special secretion of honey bees with white-yellowish color, gelatinous-viscous, sour taste, a slight characteristic smell of phenol. This component was producing from the hypopharyngeal and mandibular salivary glands of young nurse with the age between 5 and 14 days. RJ is the most important nourishment for all bee larvae, from hatching to the third day of life; then, larvae which are selected to be a queen are fed with RJ until the time at which the queen cell is operculated, and then RJ remains a special feed for the queen bee for the duration of her life. Also, RJ can affect on the longevity and fertility of queen, for example a worker bee could lives about 45 days, while a queen bee could live up to five years and able to ovipositing approximately 2000–3000 egg per day for at least three years .

Propolis

Propolis, or bee glue, is one of the popular but unfamiliar products of honey bee, which is a gum-like waxy substance found in bee hives; this sticky substance used by honeybees as cement to seal cracks and open spaces. At high temperatures propolis is soft, pliable, and very sticky; however, when cooled, and particularly at near freezing, it becomes rigid and brittle.

Propolis is collected and produced by worker bees by mixing plant resins with wax and their salvia.

Bee pollen

A mixture of microscopic particle of flower from different species is sticked by nectar and honeybee enzymes (e.g. amylase, catalase) are formed, can produce bee pollen in the form of granules. The structure of bee pollen is variable depending on regional source, botanical region, ecological situation and even the season .

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Application of antifungal agents as paclitaxel boosters in *Alternaria alternata* isolate MSh *Taxus* strain in submerged fermentation

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Statement of Problem:

Despite the fact that paclitaxel is a natural, effective anticancer agent approved by the FDA and included in the WHO's essential medicines list (EML), it is not widely available due to uneconomical and unsustainable industrial production based on low-growth and low-yielding *Taxus* trees. The fact is that endophytic paclitaxel-producing fungi will be a cheap and environmentally benign way to scale up industrial production through production enhancements (1-4).

Research Purpose:

- Increasing paclitaxel production in an endophytic fungus, *Alternaria alternata* isolate MSh *Taxus* strain isolated from *Taxus baccata*,
- Employing antifungal agents as fungal envelop destabilizers to leak paclitaxel end products from the cell or to reduce feed-back inhibition for paclitaxel production.



Research method



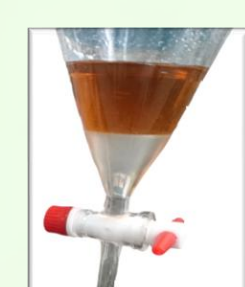
Isolation *Alternaria alternata* isolate MSh *Taxus* strain



5-day-old liquid culture



Two treatment group with:
✓ Cinnamon extract additive
✓ Clotrimazole additive



Extraction crude paclitaxel



HPLC analysis

Results and Conclusion

- Cinnamon extract raised paclitaxel production 2.7 time more than control group to 1994.78 mg/l.
- Clotrimazole boosted paclitaxel production 1.7 time more than control group to 1021.09 mg/l.
- Therefore, treating fungal culture with cinnamon extract will pave the way for microbial industrial production.

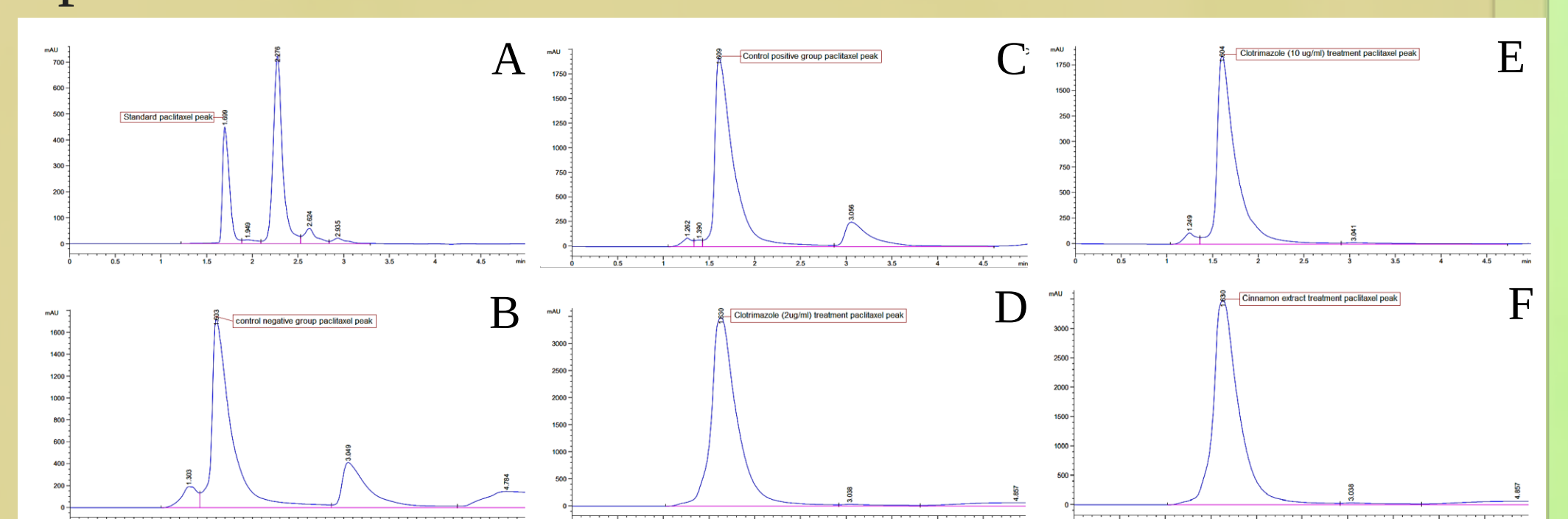


Fig. 1 Absorption Paclitaxel peak and retention times by HPLC analyses for (A) standard paclitaxel, (B) control negative group and (C) control positive group, (D) treated group with cinnamon extract, (E, F) treated group with clotrimazole in two different concentrations.

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Galium verum L.

Lady's bedstraw is a well-known species of the *Rubiaceae* family

growing up to 1800 m
above sea level

stems are 60-120 cm
long

The chemical
composition of *Galium*
species was determined
as iridoids,
anthraquinones,
triterpenic saponins,
naphthalene
derivatives, flavonoids,
lignan bis-glucosides
and alkaloids



widely-distributed
herbaceous

perennial plant with
golden yellow flowers

found in various habitats
ranging from dry-sand
fields to seashores

leaves are linear needle-
like and dark green

Advantages

- ✓ Foliage was used in the past to stuff mattresses due to its coumarin scent, which acted as a flea killer.
- ✓ Flowers have been employed to coagulate milk, and as a natural dye for wool and cheese.
- ✓ *Galium verum* has various medicinal uses, particularly as a diuretic, choleric, spasmolytic, diaphoretic, and for external treatment of skin injury.
- ✓ *Galium verum* has beneficial effects on nervousness, phobias, cardiovascular diseases, and liver disorders.

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Antibacterial activity of *Tribulus terrestris* on the pathogenic genes expression of spp *Enterobacter*



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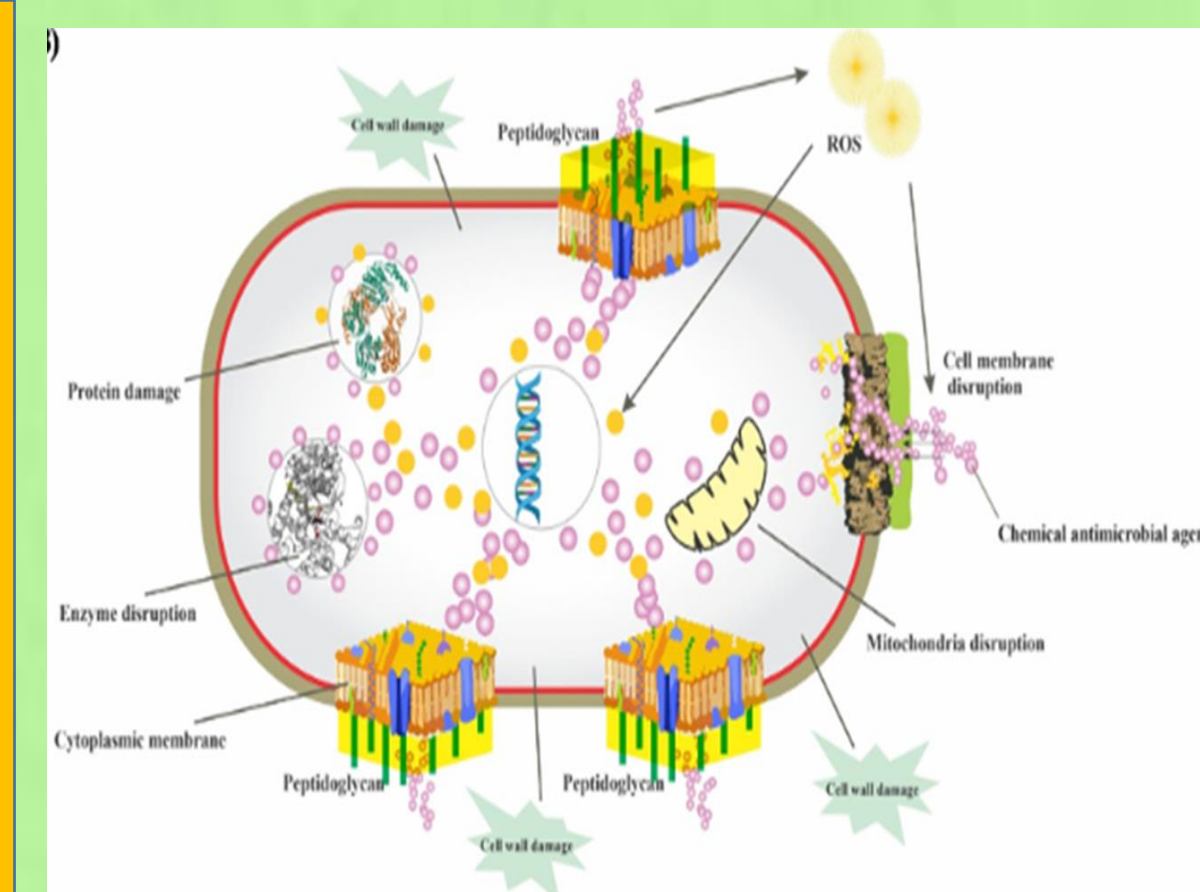


Introduction

With the emergence of multidrug resistance (MDR) bacteria, it is necessary to find novel antimicrobial agents for treating such bacteria. Natural products are a rich source of bioactive compounds and are used for the treatment of a wide range of human infections. Recent studies primarily focus on herbal products due to their effectiveness as sources of antimicrobial compounds. For example, flavonoids have been recognized as having a protective effect in plants against phytopathogens. For centuries, flavonoid-rich herbal extracts have been used to treat human diseases. *Tribulus terrestris* L. (*Zygophyllaceae*) is a popular plant in traditional European and Chinese folk medicine and it is a well patronized medicinal herb by Ayurvedic seers as well as by modern herbalists. it has been reported to have many ethnopharmacological properties including diuretic, aphrodisiac, antiurolithic, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiotoxic, central nervous system, hepatoprotective, anti-inflammatory, analgesic, antispasmodic, anticancer, antibacterial, anthelmintic, larvicidal, and anticariogenic activities. All parts (fruits, stems, leaves, and roots) of *TT* showed antibacterial activity against gram positive and gram negative bacteria, and The leaves of plant have greater extraction yield than roots. The phytochemical tests were conducted using standard methods of analyses and the extract revealed the presence of alkaloids, flavonoids, tannins, saponins and cardiac glycosides. Considering the importance of herbal products as treatments for infectious diseases, the antimicrobial activity of aqueous and ethanolic extracts of the *Tribulus terrestris* L. (*Zygophyllaceae*) from Guilan province, Iran on MDR *Enterobacter* isolates from patients suffering from UTI were examined in the current.

Material and methods

Aqueous and alcoholic extracts of *Tribulus terrestris* were prepared using conventional methods. Bacteria were isolated from urine samples of patients with urinary tract infections (UTIs). Antimicrobial activity was evaluated by well diffusion method, MIC determination, antibiofilm assay. After observing the antimicrobial effect of the extracts, the effect of the extracts was analyzed on pathogenesis genes expression of *E. coli* using Real Time PCR. All the tests were repeated three times and the data were reported as mean $\pm$ SD. The data were statistically analyzed using One-way analysis of variance (ANOVA) and differences among the means were determined at $P \leq 0.01$.

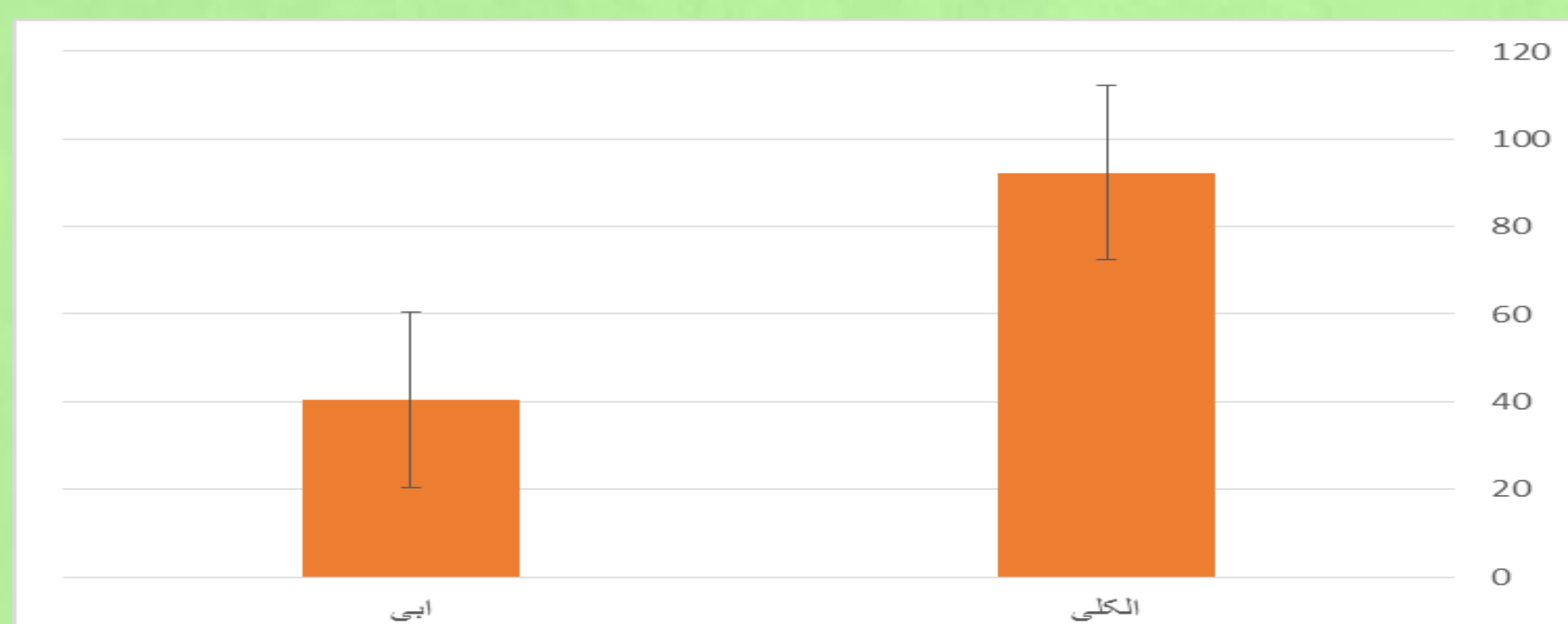


Conclusion

The extracts of *T. terrestris* (TT) are good candidates to use in the treatment of UTI due to MDR *E. coli*; although they need more investigation.

Results

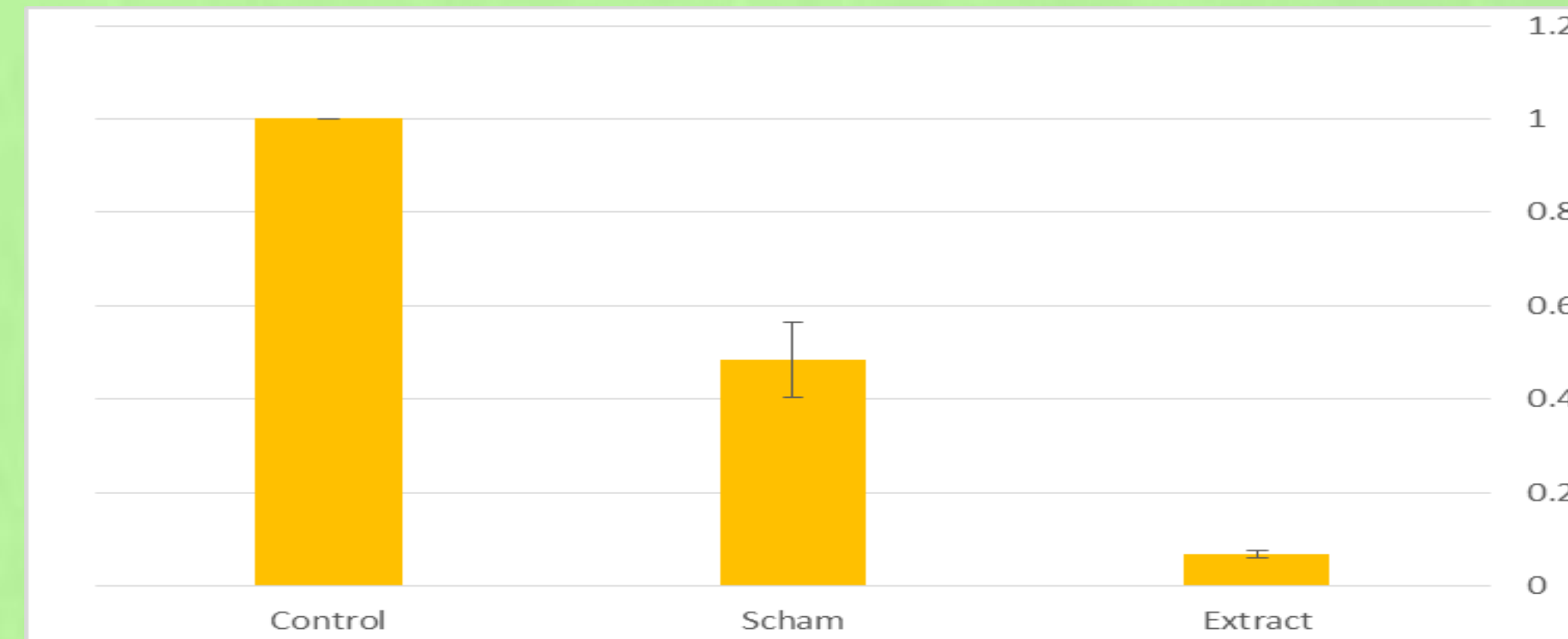
It seems that alcoholic that the extracts have significant antimicrobials to be more effective than aqueous extracts. The antimicrobial tests showed similar effects. Also, molecular analysis was confirmed that medium to high concentrations of extracts significantly reduce the expression of pathogenic genes.



Estimation of antioxidant- DPPH



well diffusion method



Effect of extract on gene expression

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Green synthesis of Ag nanoparticles using *Cyperus rotundus* aqueous extract

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Statement of Problem:

Silver nanoparticles are considering famous nanoparticles because of their antibiotic activity against viruses, bacteria, fungi, cancers and parasites[1]. *Cyperus rotundus* Linn has wide range of medicinal and pharmacological applications[2].

3,4-Dihydropyrimidine-2-(1*H*)-ones (DHPMs) have pharmacological properties and can be prepared by the Biginelli reaction (Scheme A)[3]. Synthesis of silver nanoparticles and DHPMs is difficult.

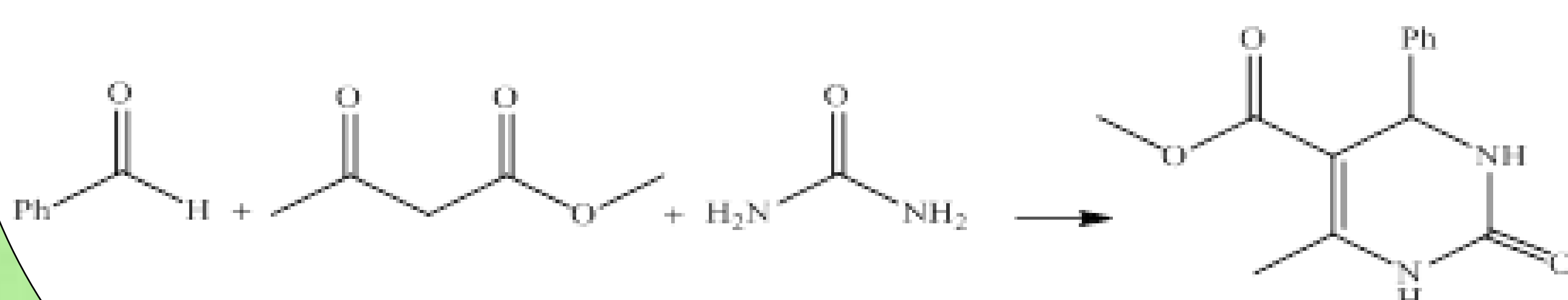
Research Purpose:

Due to the medical and pharmaceutical applications of metallic silver nanoparticles and 3,4-dihydropyrimidin-2(1*H*)-(thi)one derivatives, in this study we are looking for the green synthesis of these products.

Research Method:

The aqueous extract of *C. rotundus* was mixed with a solution of AgNO_3 and stirred at 70 °C for 15 minutes. During the reaction time, the dark brown of AgNPs was formed.

AgNPs were used as the catalyst in Biginelli reaction. benzaldehyde, urea, ethyl acetoacetate and catalyst were refluxed for 20 minutes at 100 °C.



Scheme A: Biginelli reaction

Results and Conclusion:

The XRD peaks at 38.27, 44.46, 64.72 and 77.65 correspond to the (111), (200), (220) and (311) plane (Figure A). The presence of the bands at 3100 - 3300 (N-H), 1720 (C=O) and 1100-1200 (C-O) in the FT-IR spectrum confirm the synthesis of 3,4-dihydropyrimidin-2(1*H*)-one (Figure B).

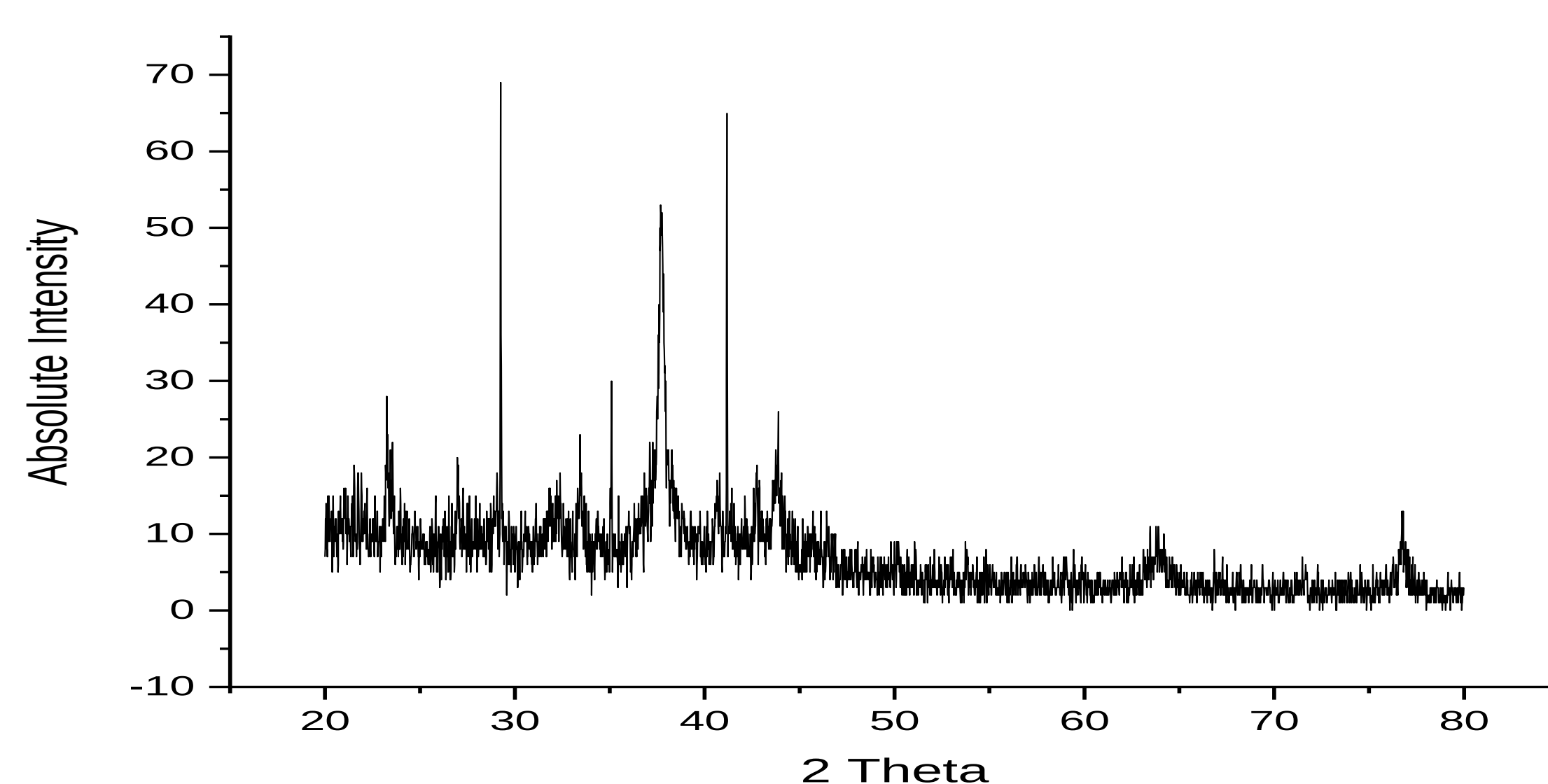


Figure A: XRD spectrum of Ag nanoparticles

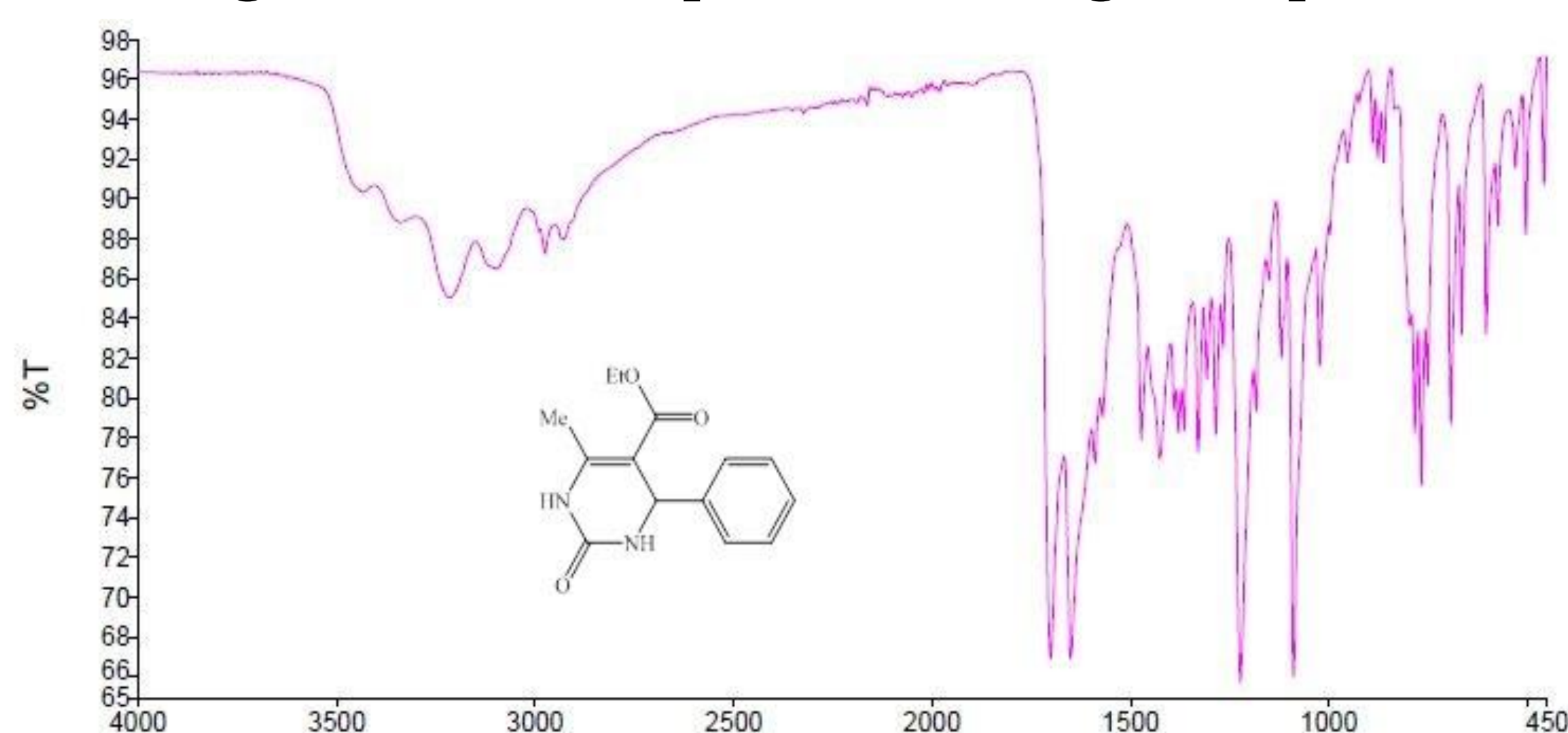


Figure B: Ft-IR spectrum of Ag nanoparticles

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Bioinformatic studies of antiviral effects of thiadiazolylcurcumin on covid-19

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Statement of problem

There is increasing evidence about the antiviral ability of herbal compounds. Treatment and control of viral diseases using plant compounds and derivatives is important because of less side effect. The coronavirus disease is a type of viral pneumonia that broke out in Wuhan, China in December 2019. This disease is a new virus that originated from the family of coronaviruses. The covid-19 disease starts with the initial symptoms of fever, cough, shortness of breath and fatigue, it infects the lungs and causes acute respiratory distress syndrome. The structure of the coronavirus includes various proteins, one of which is the Mpro protein. Mpro protein is essential for virus replication and host infection, Mpro has been an important target for coronavirus inhibitors.

Research purpose

The purpose of this project is to investigate the inhibitory potential and binding site of thiadiazolyl curcumin with the main protease of the covid-19.

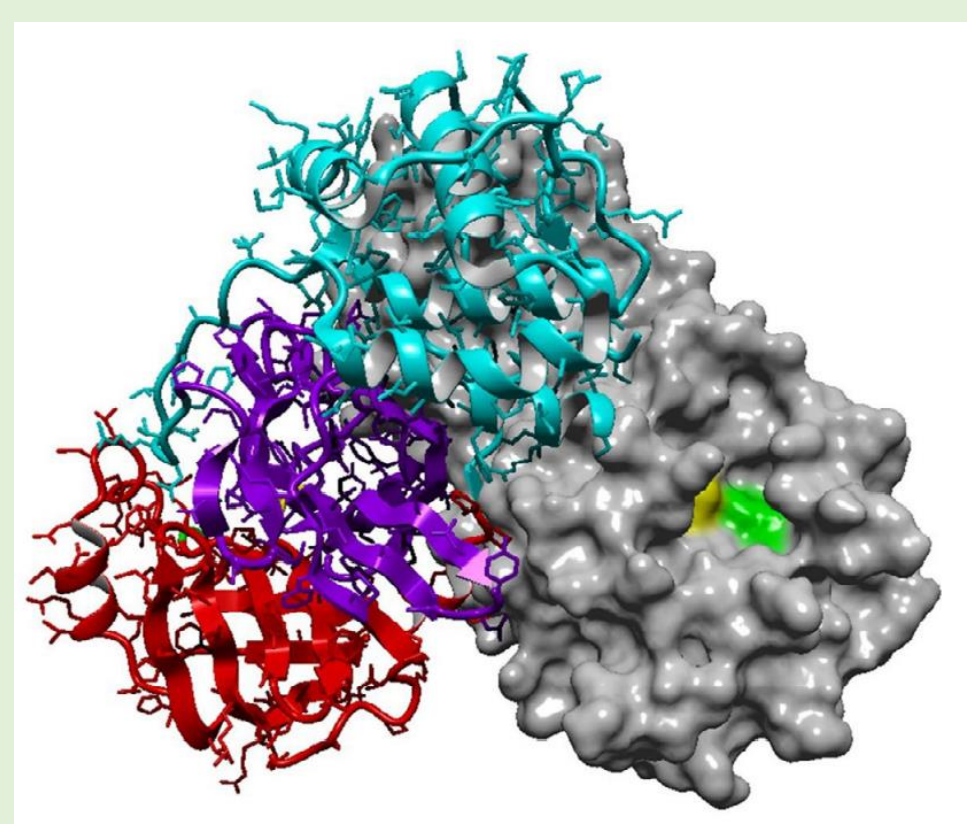


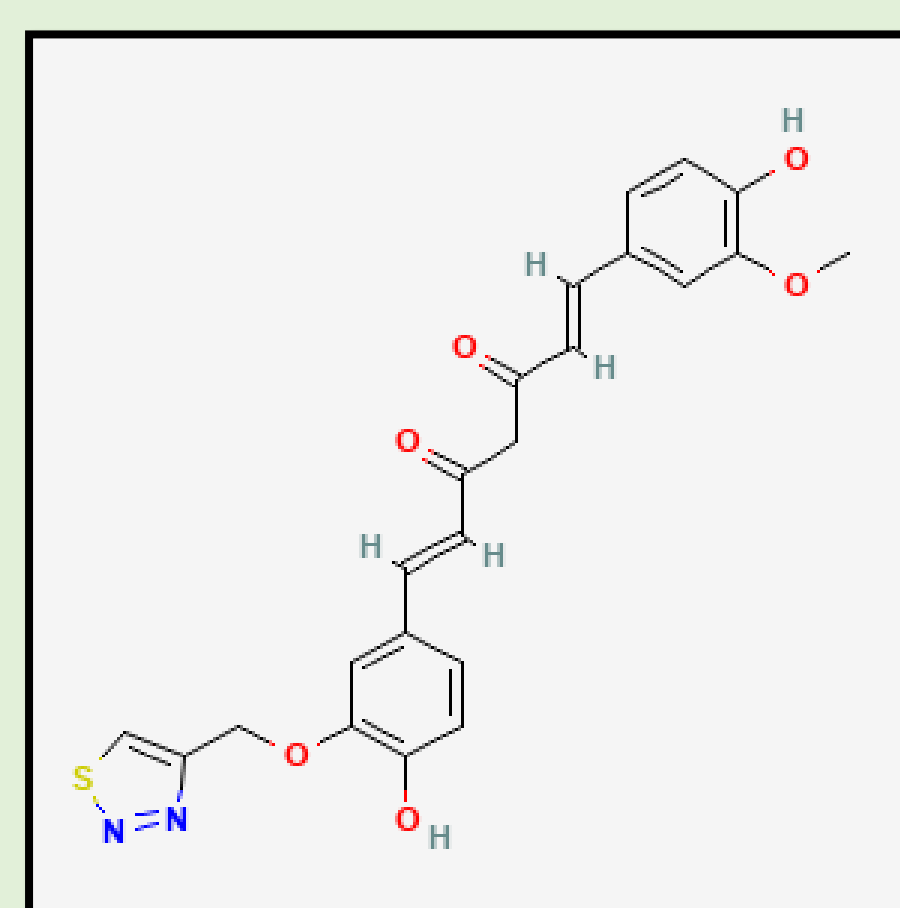
Fig .1. Structural of SARS-CoV-2 Mpro (PDB ID: 7JKV).

Research Methode

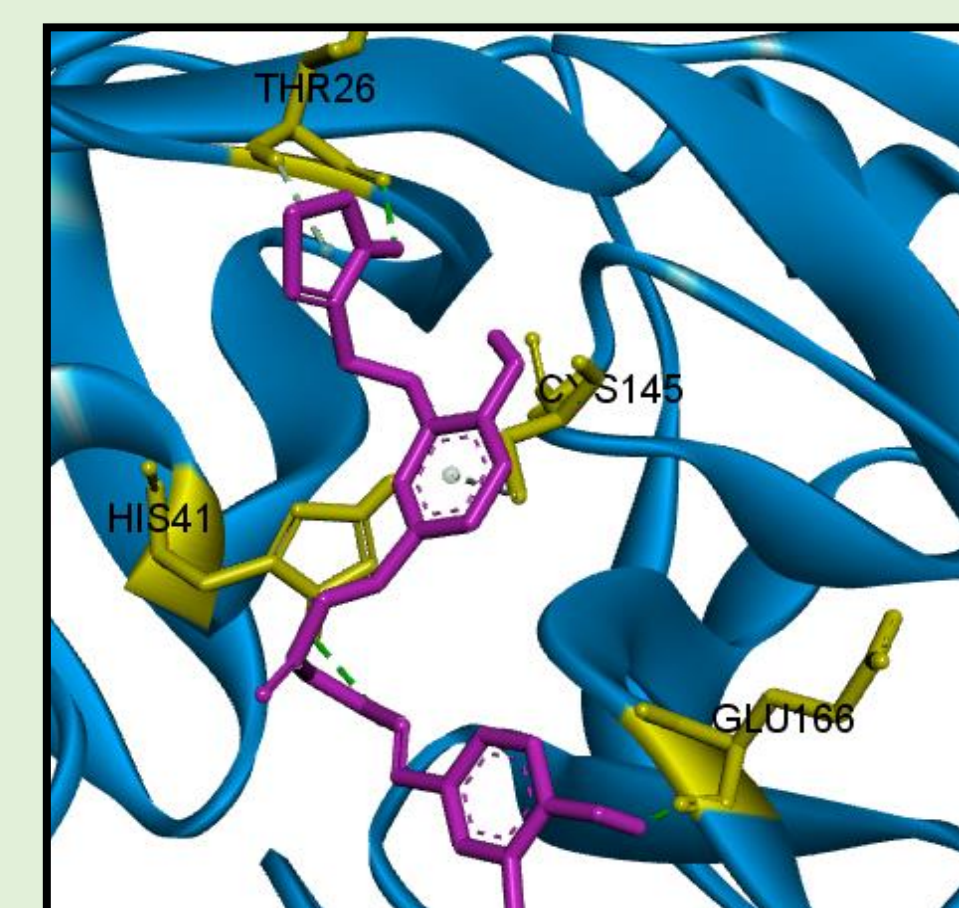
In this research, Pubchem and Drugbank databases were used to find Ligands derived from curcumin. To investigate how the compounds bind to the protease active site, energy optimization, docking studies, and final analyzes were performed with Hyperchem, AutoDockTools, and DS Visualizer software, respectively.

Results and conclusion

Thiadiazolylcurcumin with a binding energy of -5.60 kcal/mol, was selected as the best compound. In order to confirm the obtained results, it is recommended to use them for clinical trials, along with further investigations. Amino acids involved in the hydrogen bond of histidine 41, glutamic acid 166, cysteine 145, threonine 26 and amino acids involved in the hydrophobic bond of threonine 25, methionine 49, glycine 143, asparagine 142, histidine 164, methionine 165, proline 168, glutamine 189, leucine. 167, arginine 188, glutamine 192, threonine 190.



A



B

Fig .2. A. Structural of the studied compound.
B. Docking result of thiadiazolyl curcumin in the active site of MPro. This figure was prepared using the Accelrys discovery studio visualizer program.

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Title

Author name ¹, Author name ², ... ³ (correspond author *)

1-Affiliation

2- Affiliation

corresponding author Email



Quorum sensing impression of *Rhodococcus erythropolis* on Enhancement of (IPS) production from *Ganoderma lucidum*

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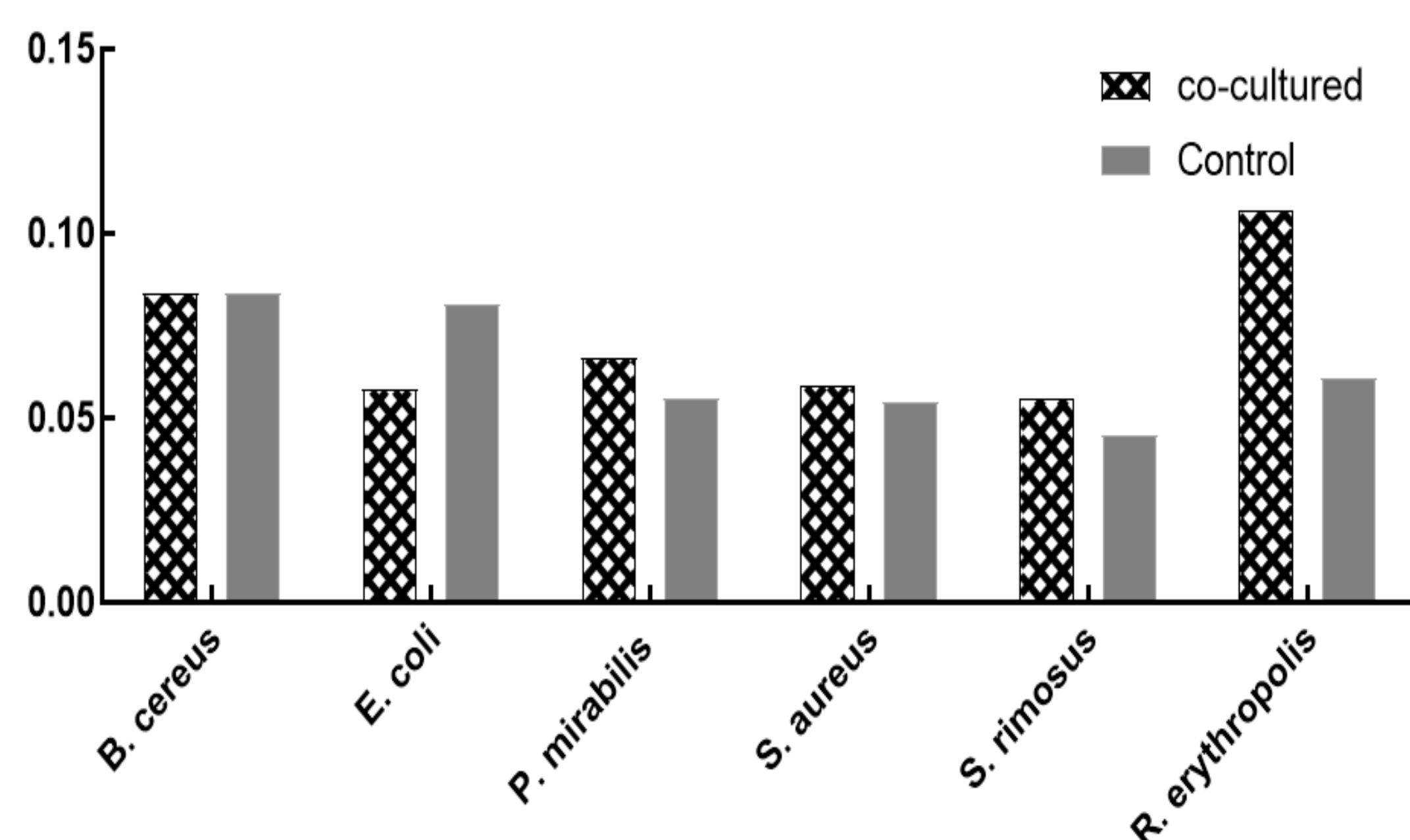
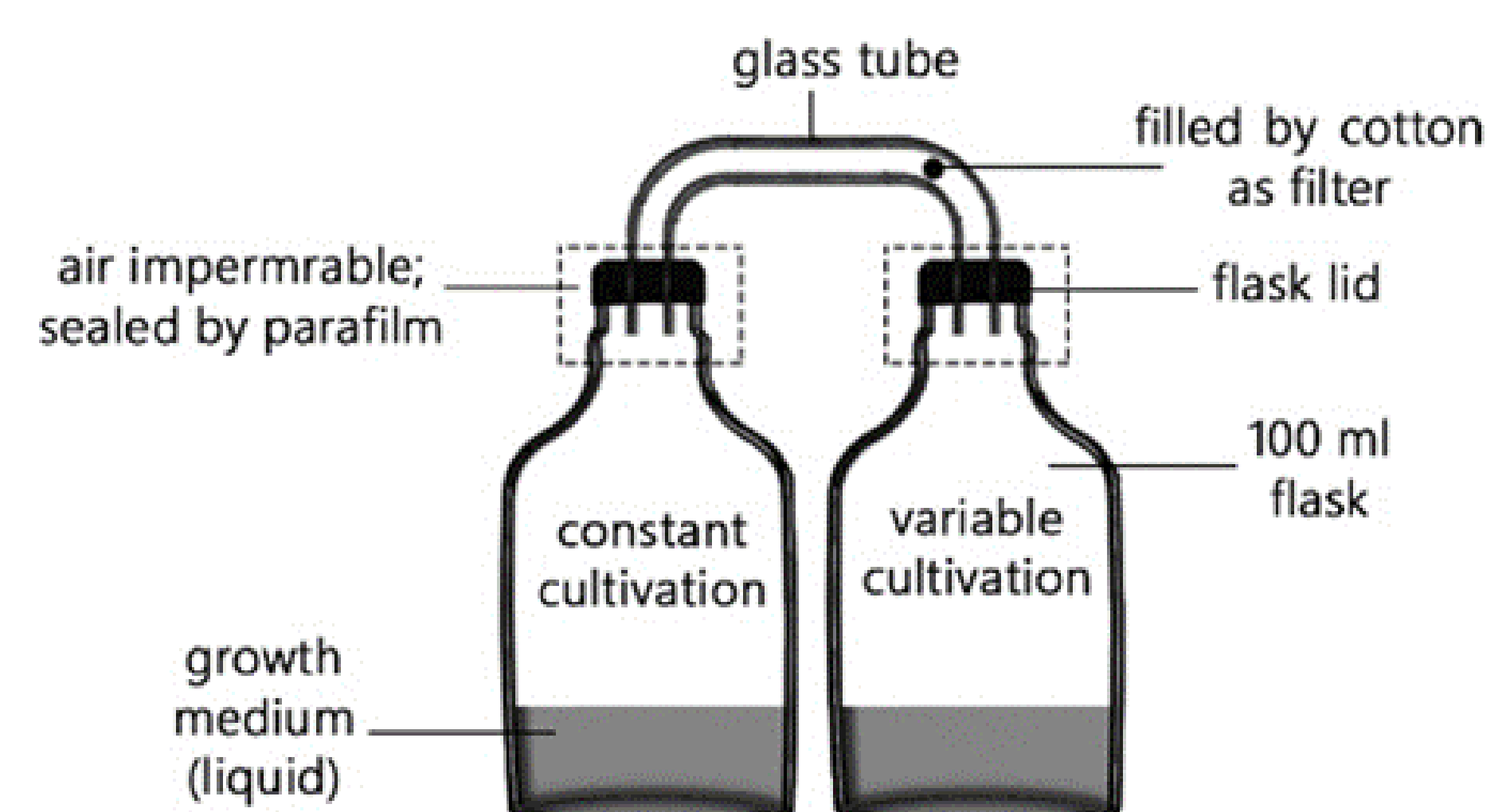
Results

The most increase in the intracellular polysaccharide (IPS) of *Ganoderma lucidum* fungus was under the influence of *Rhodococcus erythropolis* VOCs.
The esults demonstrated at least a 40% increase in intracellular polysaccharide.

Table 1: Microorganisms used for SVCC studies

Fungi	Bacteria
<i>Ganoderma lucidum</i> (IBRC-M 30306)	<i>Staphylococos aureus</i> (PTCC 1112)
	<i>proteus mirabilis</i> (PTCC 1776)
	<i>Escherichia coli</i> (PTCC 1269)
	<i>Bacillus cereus</i> (PTCC 1247)
	<i>Rhodococcus erythropolis</i> (PTCC 1767)
	<i>Streptomyces rimosus</i> (PTCC 1198)

PTCC: Persian Type Culture Collection (<http://ptcc.iroست.org/>)
IRBMC: Iranian Biological Resources Center (<http://www.ibrc.ir>)



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Chemical assessment of *Salvia syriaca* L. (Lamiaceae) in Zagros, Iran



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Introduction

The genus *Salvia* L., belonging to the family Lamiaceae, is one of the most important medicinal genera. This genus is well known for the treatment of different diseases and rich source of secondary metabolites. Regarding to the approved documents, a high chemical diversity of flavonoid-based compounds has been reported in some *Salvia* species.

There has been no report about chemical assessment at infra specific levels of *Salvia syriaca* L. using LC-MS/MS method. Therefore, the current research was conducted to develop a metabolomic approach, assess different compounds and their diversity in different chemotypes.

Research Method

Several accessions were collected from different natural habitats in the center and south-west of Zagros regions, Iran. The dried aerial parts of each sample (50gr) were subjected to ultrasonic homogenizer with 98% methanol. MS/MS analysis was performed using QTRAP mass spectrometer, conducted in negative ionization mode. A comprehensive platform for metabolomics data was applied using library matching and GNPS-Molecular Network.



Results and Discussion

The analysis revealed 92 metabolites with remarkable diversity. Molecular networks depicted specific compounds in each chemotype. The presented metabolomes mostly included fatty acids, terpenoids, flavonoids, phenolic acids, coumarins, and alkaloids. Four chemotype identities were clarified: chemotype I- flavonoid/benzoide group (syr 123), chemotype II- flavonol group, including quercetin-dirhamnopyranoside (syr 2), chemotype III- including parent mass ions at m/z 444, 823, and 478.6 (syr 158), and chemotype IV- including parent mass ions at m/z 356, 622, 433, 534.4, 744, 547.1, and 173.5 (syr 120) (Figure 1). From the earlier documents, different chemotypes were precisely elucidated in different plant species based on chemical scaffolds, indicating the effect of adaptive mechanisms and the presence of wide biological activities. The unknown compounds in molecular networking need more investigation, and their occurrence might be due to the lack of extensive mass databases in GNPS libraries.

The molecular network strongly improves specific features for each chemotype and represents the chemical profiles. The datasets of differences within the molecular families could be useful in the interpretation of the chemical diversity of *Salvia* species, the detection of related metabolites, phytomedicine fields, and pharmaceutical purposes.

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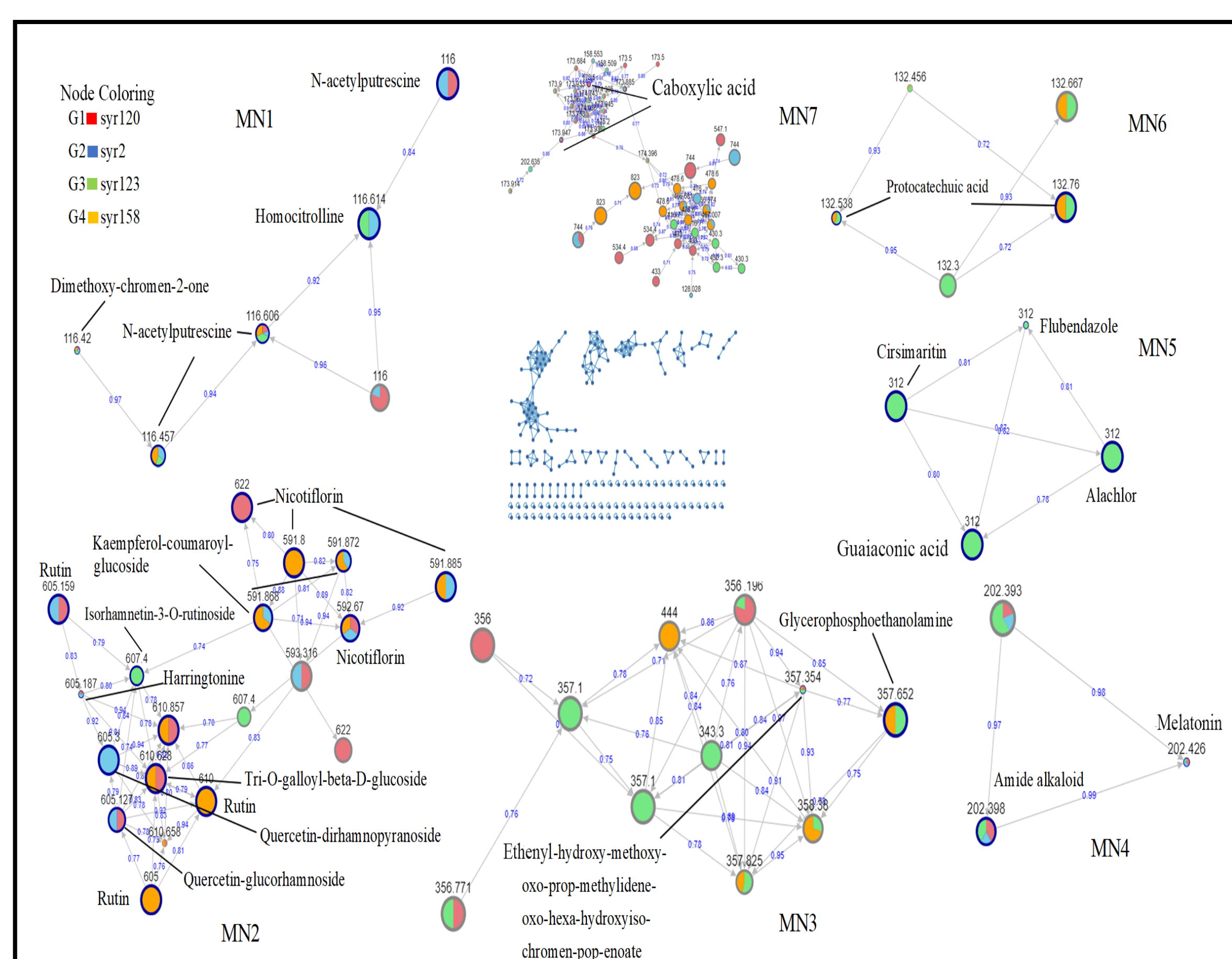


Fig. 1. Overview of molecular network (MN) clusters in *S. syriaca* accessions. The node label represents the parent mass. Node color represents accessions arranged by G1-G4, node size represents precursor intensities.

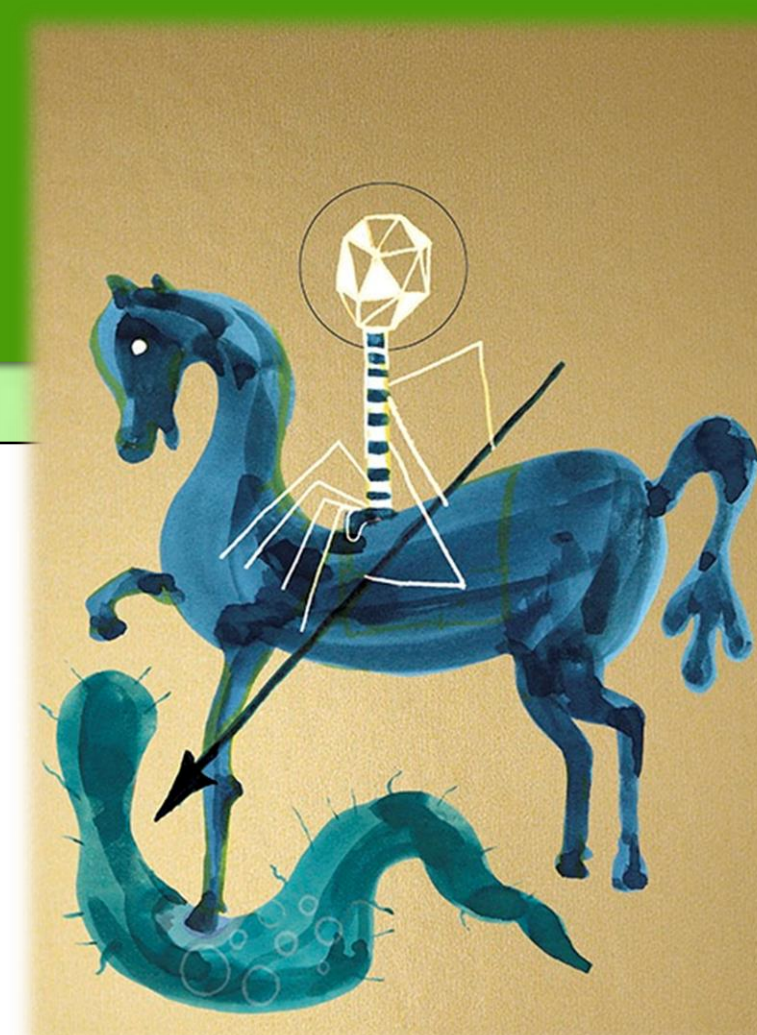
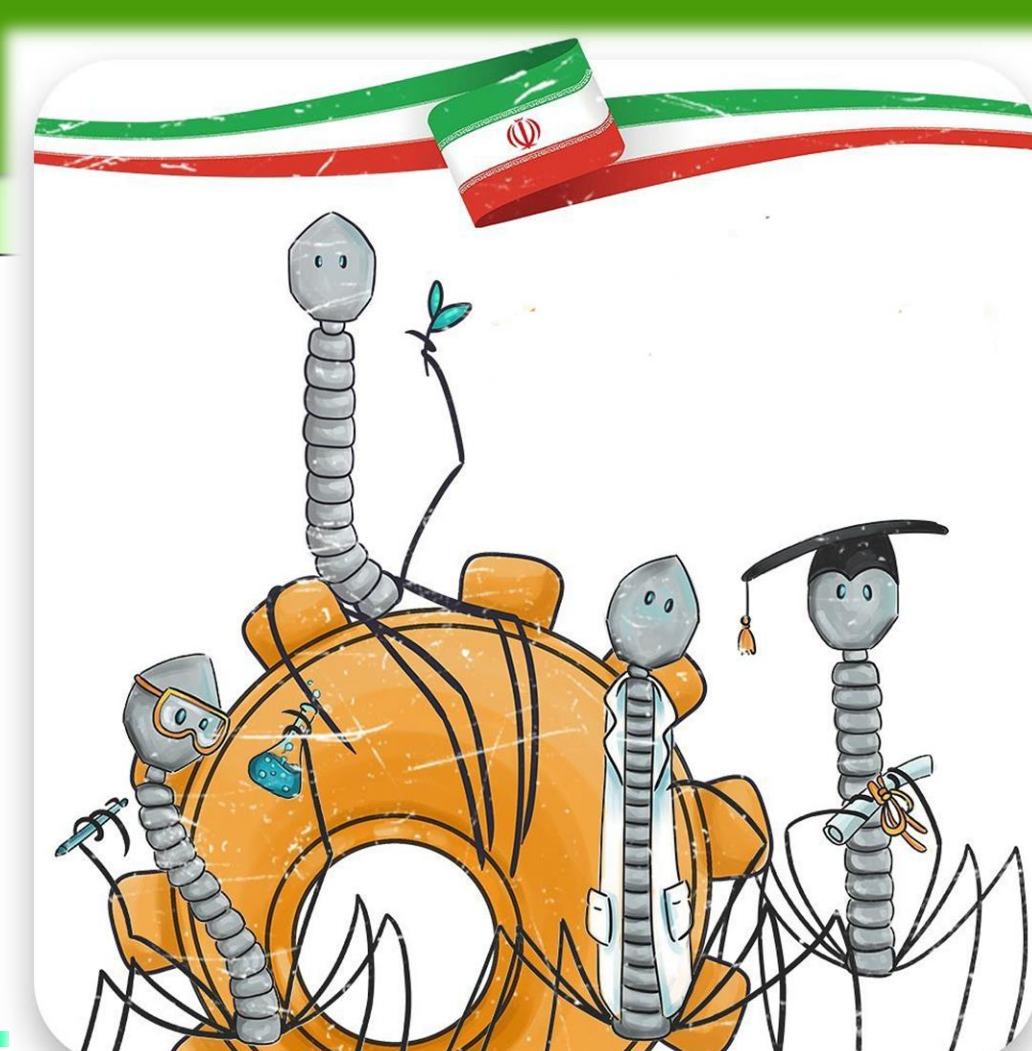
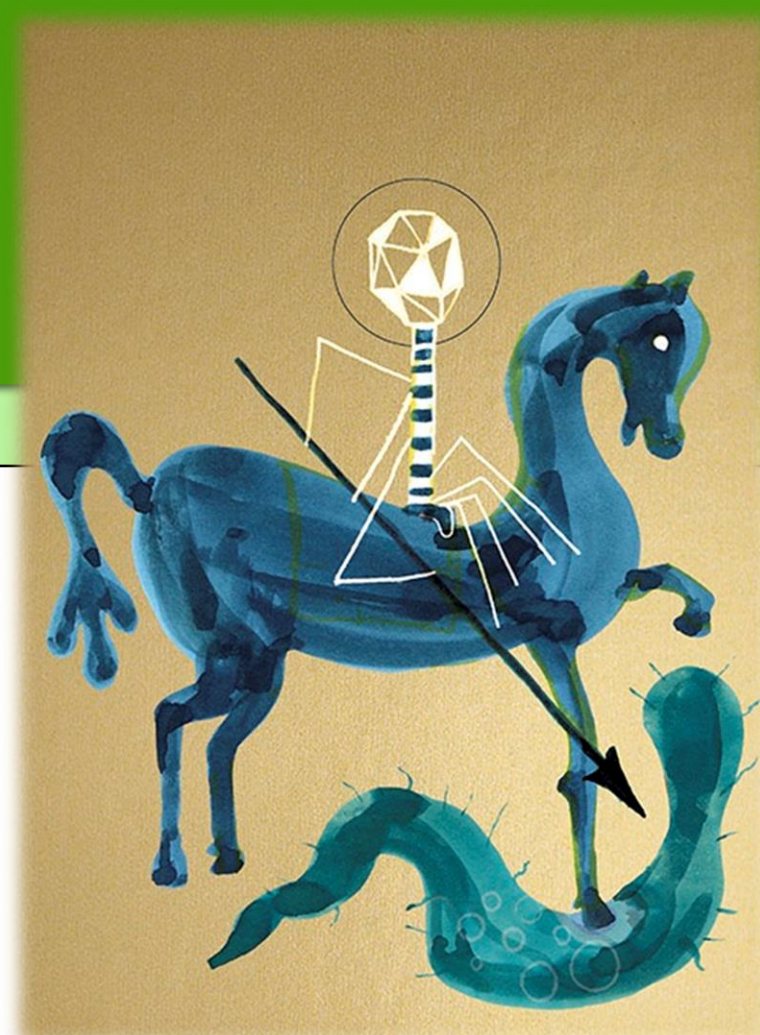
Phages Applications and Types as Alternative therapy

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Statement of Problem: Phage is a type of virus that infects many types of life forms. Phages are the most common biological entities. They can be found in soil, seawater, oceans, terrestrial surfaces, extreme environments, hospitals, animal and human bodies. Phages have been used since the late 20th century as a possible therapy against multi-drug-resistant strains of many organisms in some countries without any negative effect on human or animals.

Results and Conclusion: Phages types are categorized as, **Zoophages:** Viral parasites on animals, **Phytophages:** Viruses as parasites of plants, **Phycophages:** Algae serve as the host of this type of viruses, **Cyanophages:** Cyanobacteria serve as the host of this type of viruses, **Fungivory** or **Mycophages:** Fungi are the host for this type of viruses, **Zymophages:** Viral parasites of yeast, **Bacteriophages:** Viruses as parasites of bacteria including **Coliphages:** *E. coli* are the host for this type of viruses, **Archaeal phages:** Viruses that infect Archaea.

The potential use of phages in a broad spectrum of applications is very promising. Phages have many applications such as **diagnostics**, **antimicrobial drug discovery** and **phage display**. They also used for controlling or presentation contamination of the foods (**Food safety**), **prevention** and **control** of different types of infections in different hosts infected with the related organisms.

Research Purpose: This study is focused on an overview of the types of phages and their applications, since the use of phages has been proposed as an alternative method to control and prevent infections with pathogens.

Research Method: Related data were searched (Google Scholar and PubMed) and overviewed.

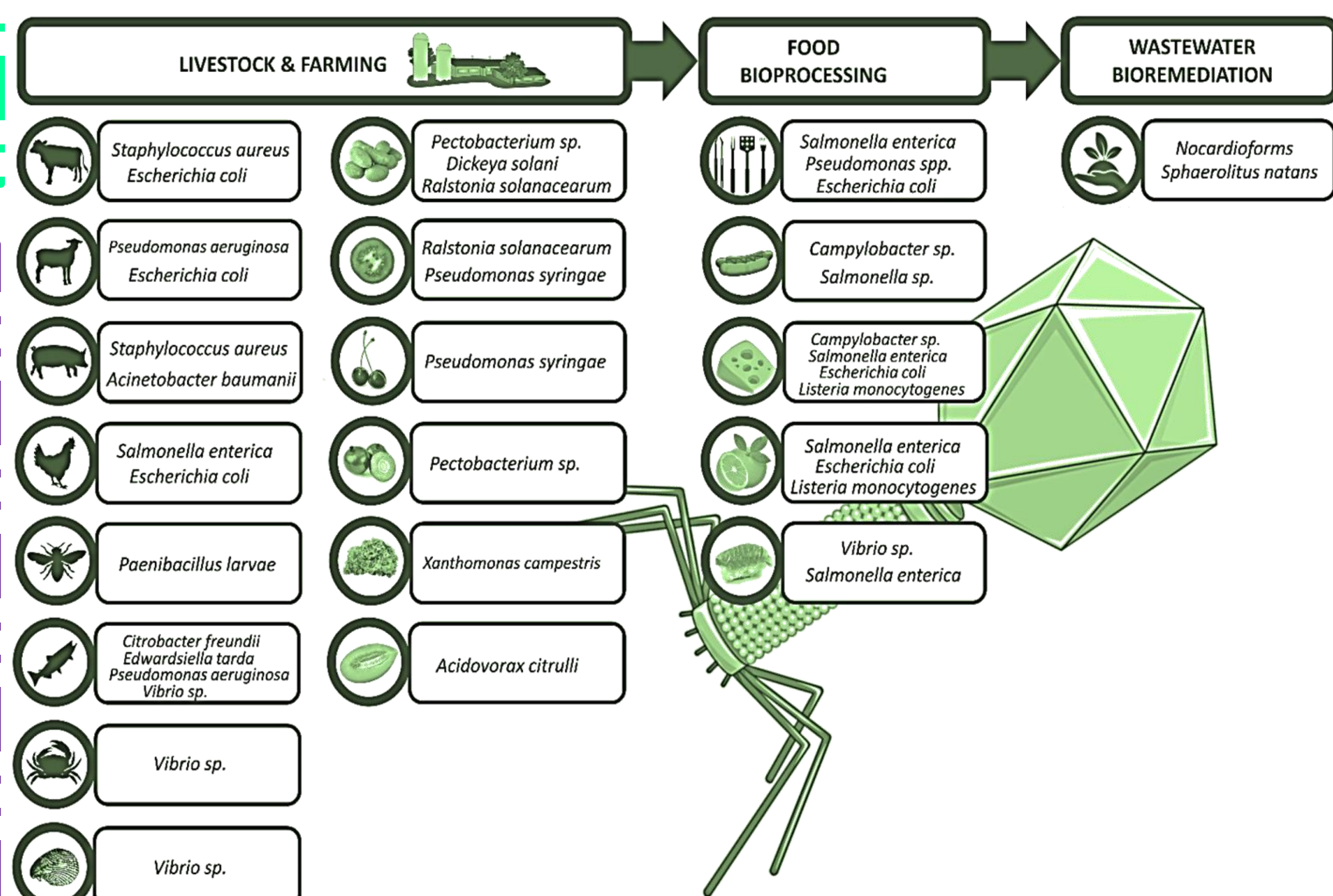


Fig 1: Phage Applications

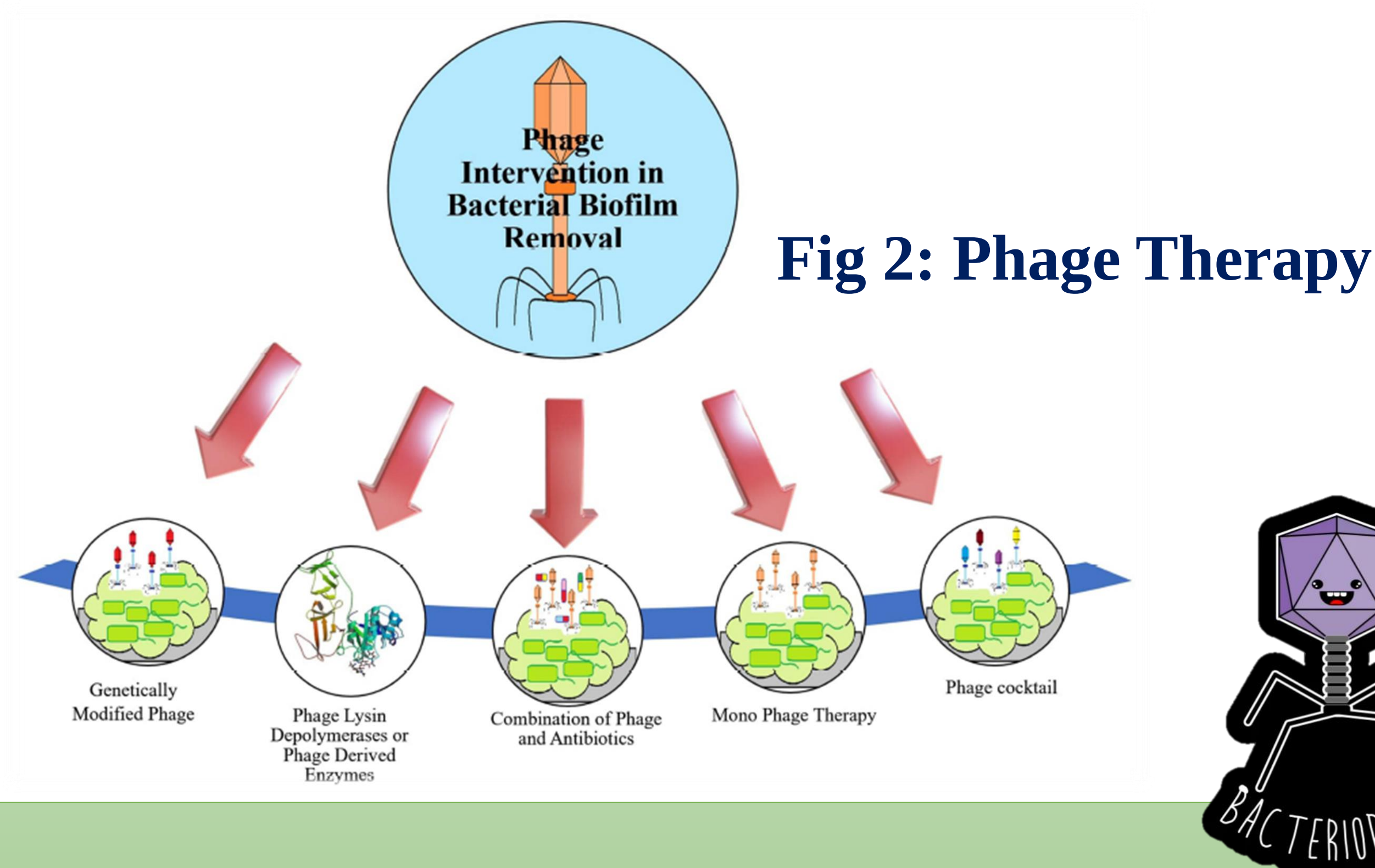


Fig 2: Phage Therapy

Sources:

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Common healing products in Makran coastal area

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Statement of Problem: Today, according to the World Health Organization, 25% of common medicines are of herbal origin. The import of medicinal plants (not including aromatic plants) in developed countries has increased from 355 million dollars in 1976 to 5.51 billion dollars in 2002, to 18 billion dollars in 2016. Also, this amount will reach to 5 trillion dollars by 2050. Despite the existing capacities in the Makran region, the production and export of medicinal plants are much lower than expected.

Research Purpose: Identifying the capacities of the Makran region to produce as many natural products as possible, especially medicinal plants, exploiting and commercializing products and exporting them to other countries through e-commerce are the most important goals of this research.

Research Method: Collect information through reading books, sites, etc.

Results and Conclusion: The most important species of medicinal plants are: *Ziziphus spina-christi*, Cedar (whose leaves are used in the pharmaceutical and detergent industries), *Tamarindus indica*, *Ricinus communis*, *Terminalia catappa*, *Alhagi persarum*, *Avicennia marina*, *Calotropis procera*, *Salvadora persica*, *Lawsonia inermis*, *Isatis tinctoria*. Many other medicinal plants that have medicinal and industrial value and are considered precious treasures also justify the establishment of pharmaceutical factories and processing industries in this region. Promotion of production to commercialization is a basic way to revive agriculture and medicinal plants in the coasts of the Makran. The trade of medicinal plant products is the most important factor in increasing the gross domestic product and plays a vital role in the social and economic development on the Makran coasts.

Keywords: Makran, Medicinal plants, Pharmaceutical industry, E-commerce.

Investigation of Lipinski parameters and antiparasitic properties of compound derived from plant flavonoid pinostrobin



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Statement of Problem

Leishmania parasite has a vital enzyme N-myristoyl transferase, which plays a role and importance in the biological mechanisms of this parasite and causes the transfer of saturated fatty acid myristate from myristoyl-coA to the amino glycine end at the protein binding site. Antiparasitic drugs target their specific parasites, the bioactive flavonoid pinostrobin has attracted attention due to its outstanding medicinal properties. In this research, Lipinski's parameters and the antiparasitic properties of the compound derived from pinostrobin in inhibiting the enzyme N - Myristoyl transferase is checked.

Research Purpose and Method

In this study, to check the hydrogen bonds and energy level, the chemical structure of the investigated molecule was first determined, and after energy optimization, docking studies and analysis of physicochemical properties and Lipinski parameters were performed using online servers. In many researches to control Leishmania, N-myristoyl transferase enzyme has been targeted; the structure of the compound was obtained from the PubCham site, Various articles were used to select the best protein code.

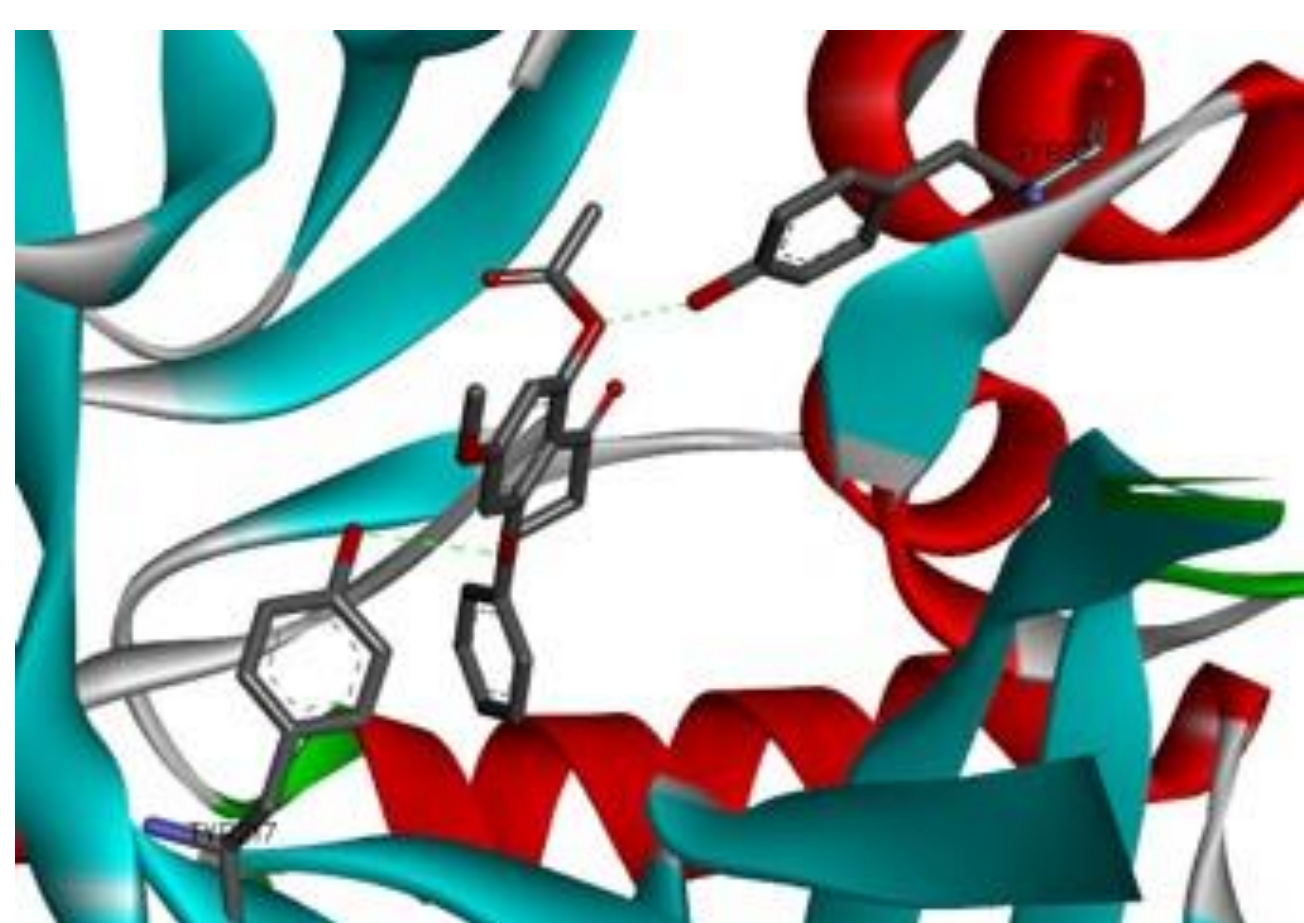
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Results and Conclusion

the results of docking ligand with N-myristoyl transferase enzyme showed that the energy level of the desired compound is -185.48. The dissolution rate of the compound in water is high and it has a high gastric absorption. this compound can be targeted and evaluated for further laboratory investigations.

Analysis



The table is a part of the pharmacokinetic results that shows the results of gastric absorption of the compound, it was observed that this compound has a high absorption rate, so it can be used as oral medicine.

The picture shows; the combination in the active site of the enzyme with amino acids, TYR217 and TYR92, participates in the formation of hydrogen bonds.

Pharmacokinetics	
GI absorption	High
BBB permeant	Yes
P-gp substrate	No
CYP ^{3A4} inhibitor	No



Analysis of genetic variation in *Lepidium sativum* as an important medicinal source



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Statement of Problem: Seeds of *Lepidium sativum* as a fast growing annual herb are rich source of proteins, dietary fiber, omega-3 fatty acids, iron, other essential nutrients and phytochemicals. It is used in folk medicine for the treatment of hyperactive airways disorders, such as asthma, bronchitis and cough. Trait profiles of genotypes and trait relations are influenced by genotypic as well as environmental factors.

Research Purpose: A little is known about trait relations of *Lepidium sativum* and the objectives of this investigation were to evaluate the performance of some genotypes, reveal the interrelationship among traits, and compare among genotypes on the basis of multiple traits, which can be candidate for future breeding of *Lepidium sativum*.

Research Method: Seventy-seven accessions of *Lepidium sativum* were obtained from Genebank Department of Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) in Gatersleben, Germany and four accessions were Iranian accessions named as Birjand, Tabriz, Kerman and Shiraz. The height of first branch (HFB), height of first silique (HFS), main axis length (MAL), number of lateral branches (NLB), number of silique per lateral branches (NSL), number of siliques per main axis (NSM), number of siliques per plant (NSP), number of seeds per silique of lateral branches (SLB), number of seeds per silique of main axis (SMA), number of seeds of silique per plant (NSSP) and plant height (PH). Also, days to emergence (DE), emergence percent (EP), days to flowering (DF), flowering period (FP) and days to maturing (DM) were recorded as well as days to flowering and thousand-seed weight (TSW). The middle rows were harvested to determine biological yield and seed yield. The genotype by trait biplot method was used to display the genotype by trait two-way data using the software GGEbiplot package.

Results and Conclusion: The polygon-view of the genotype by trait biplot is the best way to visualize the structure of relations between genotypes and traits. Figure 1 represents the mentioned biplot generated from data on morphologic traits of *Lepidium sativum* genotypes. The following information can be seen from this figure: the vertex genotypes for the first year are G23, G59, G61, G51, G6 and G12, and the trait fell into the sectors of G23 and G12 in the first year. Therefore, genotype G12 had the highest values of plant height (PH), main axis length (MAL), seed yield (SY) and biological yield (BY) traits; and genotype G23 had the highest values of the other remained traits (Figure 1).

Therefore, there are two vertex genotypes in Figure 1 which were favorable for some traits but the rest of them (four vertex genotypes) were not favorable for any garden cress traits.

An analysis of variance confirmed results of the genotype by trait biplot that there was significant genotype $\times$ trait interactions in most of measured traits. This means that *Lepidium sativum* genotypes may produce high seed yield only in some genotypes and the traits are not stable across genotypes. In the testing of different interactions for significance, one of the common practices is the tendency to apply multiple mean comparisons while these comparisons do not give extra information about the nature of interactions such as positive or negative interactions. Therefore, the genotype by trait biplot procedure, gives the same information as analysis of variance as well as additional information of multiple mean comparisons (Dehghani et al., 2008).

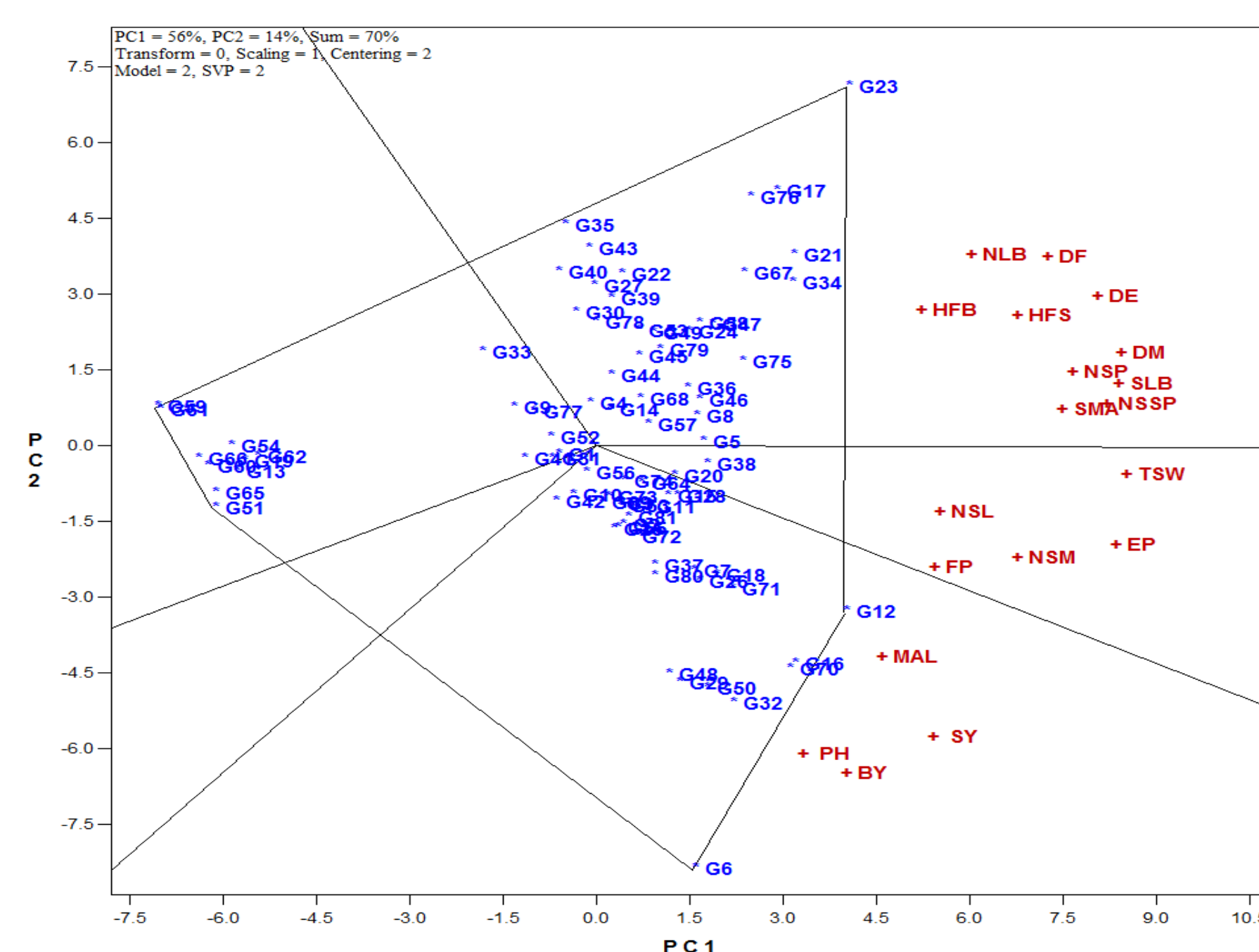
However, genotypes G12, G20, G23, G32 and G53 as the vertex genotypes were the most favorable genotypes in the most important studied traits of *Lepidium sativum* in each two years. On the other hand, genotype by trait biplot explained most of the variation (70 %) due to *Lepidium sativum* genotypes main effects plus genotype $\times$ trait interaction effects. It can be said that almost all information contained ANOVA and multiple comparisons of genotype means is graphically displayed in a genotype by trait biplot. Ma et al. (2004) in *Triticum aestivum*, and Dehghani et al. (2008) in *Brassica napus*, also reported similar findings in the studying of effects of genotype, environment, treatment, trait and their interactions. Finally, the biplot shows a complete picture of the interrelationships among genotypes and traits (Yan and Rajcan, 2002). For above mentioned reasons we prefer the use of genotype by trait biplot model for analyzing in *Lepidium sativum* dataset. Similar reports demonstrated that the genotype by trait biplots were an excellent tool for visualizing genotype $\times$ trait dataset and revealing the interrelationships among different traits (Rubio et al., 2004).

Keywords: biplot analysis, germplasm collection, traits association.

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Figure 1. Polygon-view option of biplot representing the “which-won-where” pattern of traits and genotypes.





Evaluation of foliar application of salicylic acid on quantity and quality of *Cynara scolymus* as a medicinal source

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Statement of Problem: Among the herbal medicines the *Cynara scolymus* used in treatment of hepatic/biliar diseases, gastrointestinal disorders. It is source of Ca, K, Mg, Na, P, Cu, Fe, Mn, Se, and Zn. Trait profiles under salicylic acid application and trait relations are influenced by genotypic as well as environmental factors.

Research Purpose: A little is known about trait relations of *Cynara scolymus* and the objectives of this investigation were to evaluate its performance under salicylic acid application, reveal the interrelationship among traits, and compare among genotypes on the basis of multiple traits, which can be candidate for next improvement of *Cynara scolymus*.

Research Method: The experimental trial was conducted in randomized complete block design using factorial arrangement with three replicates. The first factor was consisting on three planting dates spaced at about 19 April, 5 and 20 May while the second factor was consisting on three salicylic acid concentrations (0, 700 and 1400 μ M). Salicylic acid (SA) was dissolved in absolute ethanol then added drop-wise to water (ethanol/water: 1/1000, v/v). Salicylic acid was applied on the foliage of plants with a hand sprayer on 45 days' plants at the five-leaf stage). A control group of plants was grown sprayed with deionized water. Chlorophyll content was measured on ten leaves of a plant at each plot, using a portable chlorophyll meter. The relative water content (RWC) was determined. Leaf area, leaf number per plant, plant fresh forage yield, dry matter and forage quality were recorded. Dry matter yield was determined through the weighting the dried plants at 70°C for 24 h. Primary statistical analyses were performed using the Anderson-Darling normality test and Levene homogeneity test. Homogeneity of residual variance was determined by Bartlett's homogeneity test. To explore treatment by trait interaction variability, the SREG model was used presented by Yan and Rajcan (2002). To visualize correlations between traits, a vector view biplot was made. These graphic analyses were done using the GGEbiplot software.

Results and Conclusion :

The treatment by trait biplot explained 63 and 29% of the total variation of the standardized data, respectively (Figure 1). This high percentage reflects the ability of biplot model to modeling the relationships among the measured traits of *Cynara scolymus*. The fundamental structures among the traits should be captured by the biplots. In the treatment by trait biplot, a vector is drawn from the biplot origin to each of the traits to facilitate visualization of the relationships among traits; and the correlation coefficient between any two traits is approximated by the cosine of the angle between their vectors. In other word, provided that the biplot explained a sufficient amount ($\geq 50\%$) of the total variation, two traits are positively correlated if the angle between their vectors is $< 90^\circ$, negatively correlated if the angle is $> 90^\circ$, independent if the angle is 90° (Rubio et al., 2004). Also, traits with longer vectors are more responsive to the treatment genotypes; traits with shorter vectors are less responsive to the treatment genotypes; and those located at the biplot origin are not responsive at all. The most prominent relations revealed by vector-view biplot (Figure 1) are: a positive association between FWA and DWA and in lower step among LA, LN FWA and DWA as indicated by the acute angles (Figure 1).

There were near zero coloration between RWC and Chl as indicated by the 90° angle while we did not found any negative association among traits sue to the large obtuse angles between vectors of the traits.

The polygon-view of the treatment by trait biplot is the best way to visualize the structure of relations between treatments and traits. Figure 2 shows the mentioned biplot generated from data on traits of *Cynara scolymus*. The following information can be seen from this figure: the vertex treatments are P1-S3, P3-S1 and P3-S3, and most traits fell into the sector of P3-S3. Therefore, treatment P3-S3 had the highest values of all traits except relative water content (RWC) which was felt in sector of treatment P3-S1 (Figure 1). Therefore, there are two vertex treatments in Figure 1 which were favorable for some traits but the rest of them (one vertex treatment as P1-S3) were not favorable for any garden cress traits. It seems that application of salicylic acid in high magnitudes with delay planting can increase the performance of most traits in *Cynara scolymus*.

Our results showed that spraying salicylic acid on the *Cynara scolymus* plants enhanced plant growth especially in high concentration while sowing date influences its growth, development and yield depending on salicylic acid concentrations due to observing the interaction effects between two factors. Although, the meaningful difference was not observed between second and third sowing dates in analysis of variance, but the treatment by trait biplot identified the P3-S3 (sowing 20 May and spaying salicylic acid at concentration 1400 μ M) treatment combination as the best. It was shown that foliar application of acid salicylic on plants under normal growth conditions provided protection against stresses. Besides, the obvious visual symptom, this conclusion was confirmed by chlorophyll fluorescence parameters and electrolyte leakage measurements from the leaves (Hosseinzadeh et al. 2013).

Keywords: SREG analysis, sowing date collection, traits coloration.

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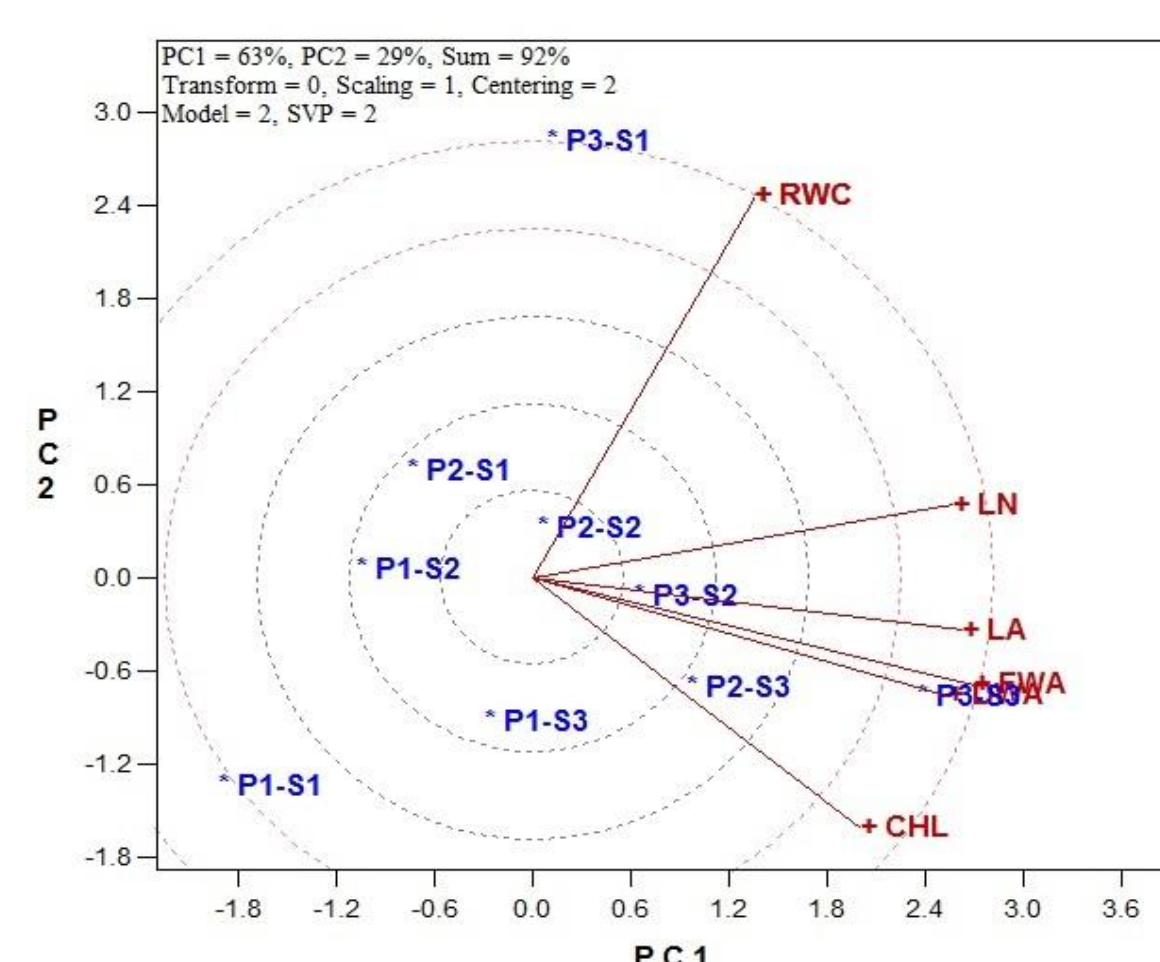


Figure 1. Vector-view option of biplot representing the relationships pattern of traits.

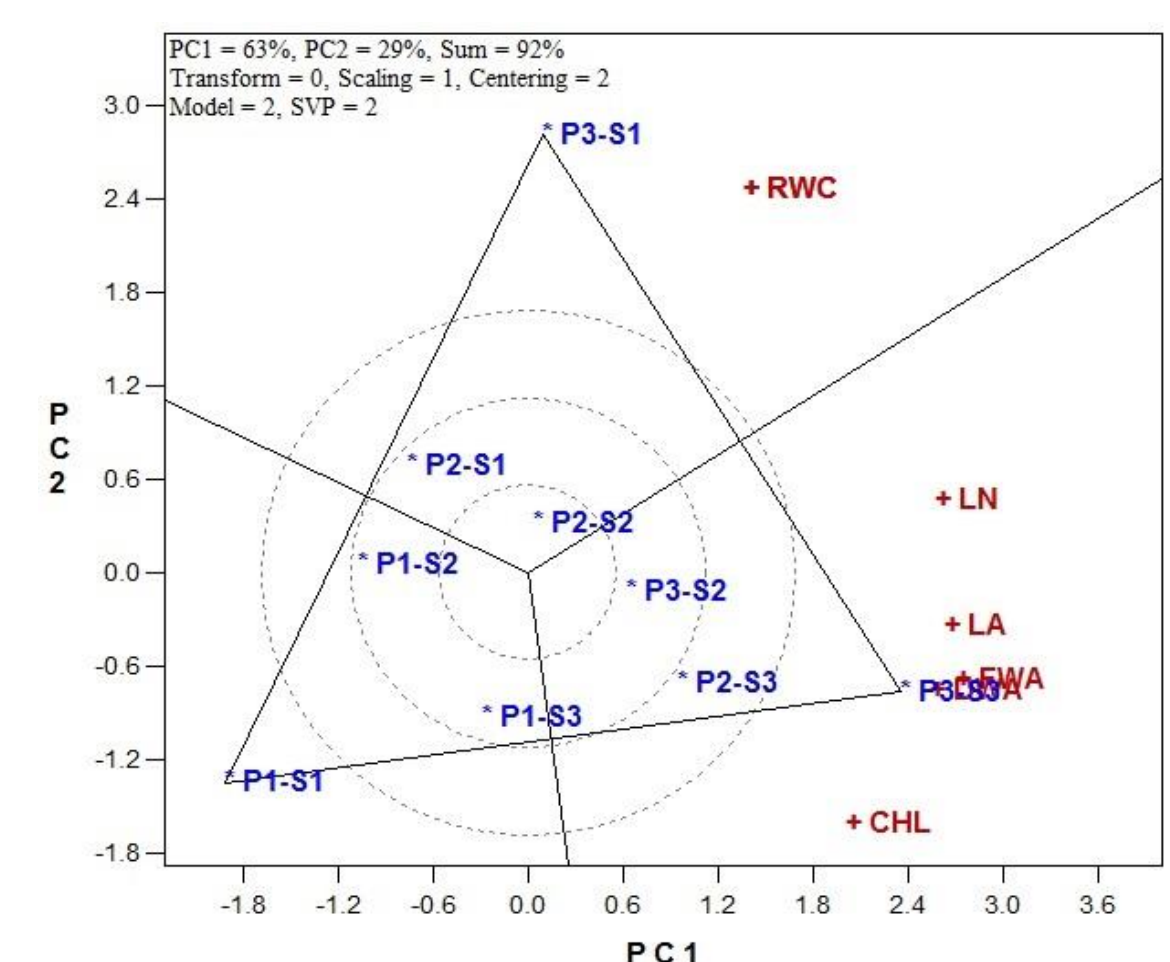


Figure 2. Polygon-view option of biplot representing the "which-won-where" pattern.



Genetic variation of medicinal herb *Spinacia oleracea* using biplot analysis

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Statement of Problem: *Spinacia oleracea* is an edible plant from the Amaranthaceae is native to central and Southwestern Asia and a rich source of various vitamins (A, C, E, K, B6 and B2), magnesium, manganese, folate, betaine, iron, calcium, potassium, folic acid, copper, protein, phosphorous, zinc, niacin, selenium and omega-3 fatty acids. *Spinacia oleracea* packed with a number of anti-oxidants like polyphenols, flavonoids and carotinoids which are shown to possess anti-inflammatory effects, antimutagenic potential, anti-neoplastic effects as well as chemo-preventive activates.

Research Purpose: Various activities of *Spinacia oleracea* have been reported and various secondary have been reported from this plant while a little is known about trait relations of *Spinacia oleracea* and the objectives of this research were to evaluate the performance of some genotypes, reveal the interrelationship among traits, and compare among genotypes on the basis of multiple traits, which can be candidate for future breeding of *Spinacia oleracea*.

Research Method: Sixteen *Spinacia oleracea* germplasm were evaluated in a randomized complete block design with four replication times. Each plot contained six 3 m long rows with 25 cm between rows and plot size was 4.5 m². Control by hand weeding was carried out twice when the weed density was high, in the pre-flowering and post-flowering stages. Several quantitative traits consist on leaf length (LL), leaf width (LW), petiole length (PL), petiole diameter (PD), leaf area (LA), leaf numbers in flowering (LN), days to flowering (DF), female plants percent (FP), fresh yield (FY) and dry yield (DY) were measured. The datasets were first tested for normality by Anderson and Darling normality test. The genotype $\times$ trait biplot model (Yan and Fréreau-Reid, 2018) was used to show the two-way pattern of *Spinacia oleracea* landraces' traits in a biplot model. All biplots were generated using the software GGEbiplot package.

Results and Conclusion : The genotype $\times$ trait biplot explained 68 and 11% of the total variation. This relatively moderate percentage reflects the complexity of the relationships among the measured traits. The mean effects of the measured across genotypes were examined by defining an average tester coordinate axis and an average or virtual genotype is indicated by a circle and shows the positive end of the axis. Ideal genotype is it that should have large PC1 scores (high traits' means) and small (absolute) PC2 scores (low variability). Genotypes with above average means was selected, whereas the rest were discarded, thus genotype C7, C8, C11, C13, C15 and C16 were the most favorable genotypes regarding all of the measured traits due to its low distance from horizontal axis (Figure 1).

According to ideal tester (trait), leaf area was the most representativeness one and had the most discriminating ability for detection differences among genotypes. Ranking of the best traits based on the ideal tester was PD> DF=PL=DY=FY> LN=LW > LL > FP (Figure 1). The polygon view of the GT biplot helps identify genotypes with the highest values for one or more traits and provides the best way for visualizing the interaction patterns between genotypes and traits and to effectively interpret a biplot. The biplot Figure 1, as polygon view, presents data of 16 *Spinacia oleracea* landraces in ten traits and the following information can be understood: the vertex landraces or genotypes in this investigation are C1, C3, C4, C8 and C14. These landraces are the best or the poorest landraces in some or all of the traits since they had the longest distance from the origin of biplot (Ebadi-Segheloo et al., 2014). Therefore, it seems that C14 had the highest values for traits leaf width (LW), petiole length (PL), leaf area (LA), leaf numbers in flowering (LN), days to flowering (DF), fresh yield (FY) and dry yield (DY). This genotype (C14) and the other genotypes of this sector had good amounts of above mentioned traits. The vertex landrace C8 and its related genotypes which fall in its sector were good for petiole diameter (PD), leaf length (LL) and female plants percent (FP). Therefore, there are two vertex genotypes in Figure 1 which were favorable for some traits but the rest of them (four vertex genotypes) were not favorable for any *Spinacia oleracea* traits. Finally, the biplot shows a complete picture of the interrelationships among genotypes and traits (Sabaghnia et al., 2016). The petiole diameter (PD), days to flowering (DF) and leaf area (LA) were positively associated with each other while petiole diameter (PD), days to flowering (DF), and leaf area (LA) were positively correlated with each other (Figure 1). The female plants percent (FP) did not show any positive or negative association with the petiole diameter (PD), days to flowering (DF) and leaf area (LA). For above mentioned reasons we prefer the use of genotype by trait biplot model for analyzing in *Spinacia oleracea* dataset. Similar reports demonstrated that the genotype by trait biplots were an excellent tool for representing genotype $\times$ trait.

Keywords: Germplasm collection, site-regression analysis, traits association.

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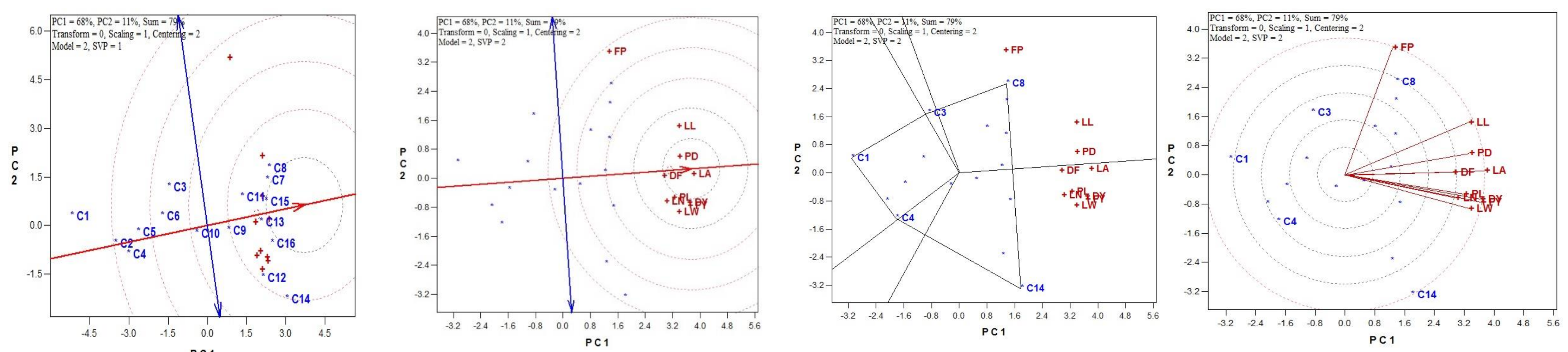


Figure 1. The genotype $\times$ trait biplot model ideal genotype, ideal trait, polygon-view, and tester view, respectively.



Anthocyanin extraction from barberry and check the antibacterial effect of its on the gram positive and negative bacterial

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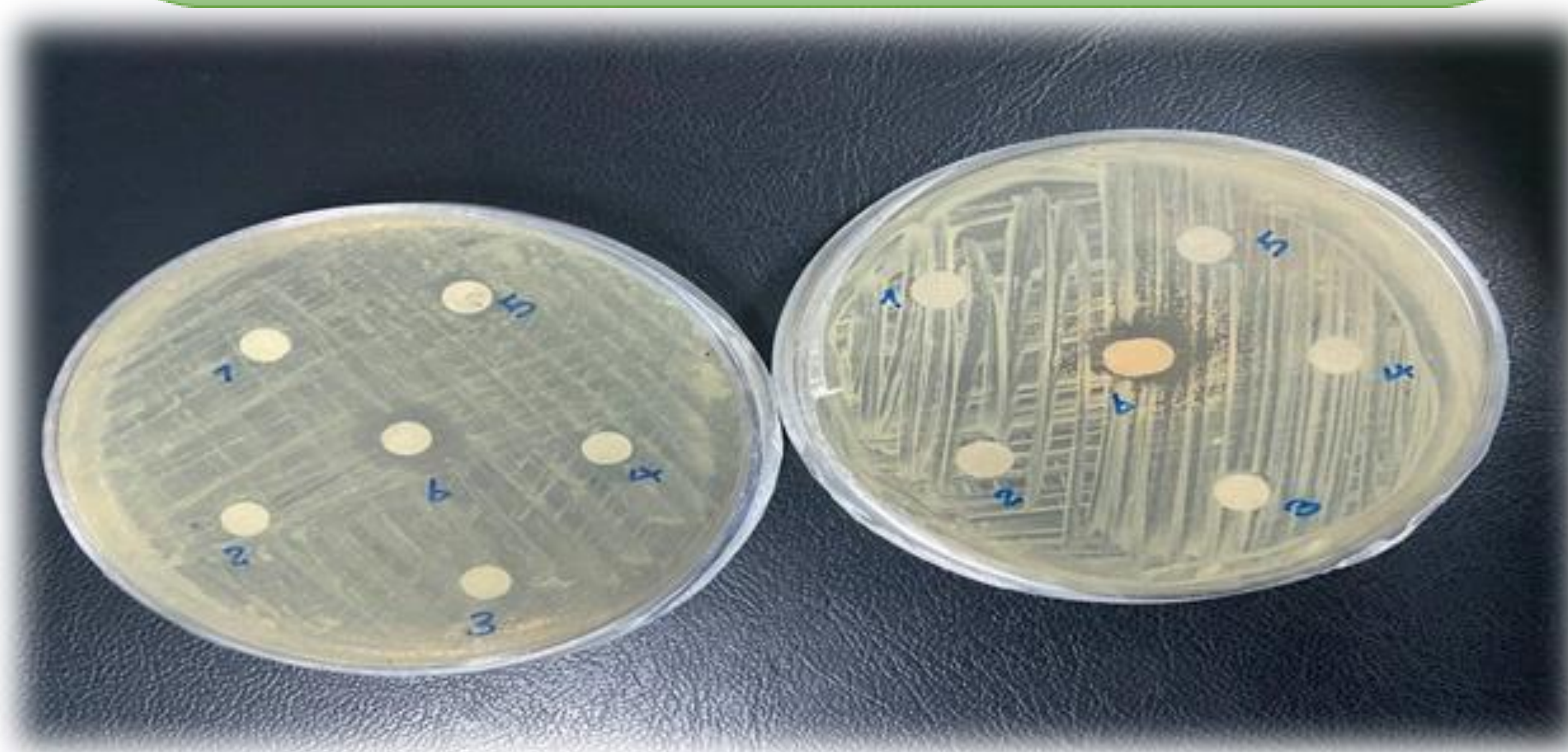
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Introduction:

Statement of Problem: Natural products are an important source of new drugs or serve as templates for the development of new synthetic drugs, from anticancer therapies to antibiotics. Due to the increasing prevalence of life-threatening bacterial



Research Method:

In order to test the anthocyanin's characteristics, we extracted the anthocyanin-containing extract with homogenize, water, and ethanol methods. The antibacterial assay of barberry extract products was performed against *Escherichia coli* and *Bacillus subtilis*. For this test, we utilize Luria-Bertani Agar medium that contains 1.5 g of agar, 0.5 g of yeast, 1 g of NaCl, 1 g of tryptone, and 100 ml of distilled water. Concentrations studied, 1, 3 and 5 μ M concentrations of the anthocyanin-containing extract are prepared and placed on discs.

After 24 h incubation in bacterial culture, the diameter of the growth inhibition zone of barberry extract products was measured. A clear zone surrounding bacteria indicates that the antimicrobial treatment has effectively stopped or prevented microbial development.

Result:

Results and Conclusion: The antibacterial effects of barberry anthocyanin are therefore indicated by halos of lack of growth surrounding the disc. The minimum inhibitory concentration, or MIC, in microbiology is the lowest concentration of a chemical that can stop a particular type of bacterium from growing visibly. The lowest concentration of anthocyanin solution, which prevents bacterial growth in this test, is 5 μ M. The clear zone size was 19 mm for *Escherichia coli* and 14 mm for *Bacillus subtilis*.

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antimicrobial effect of Lavandula essential oil and two probiotic *Lactobacillus casei* and *Sacharomyces boulardii* on pathogenic bacteria and investigating their synergistic effect

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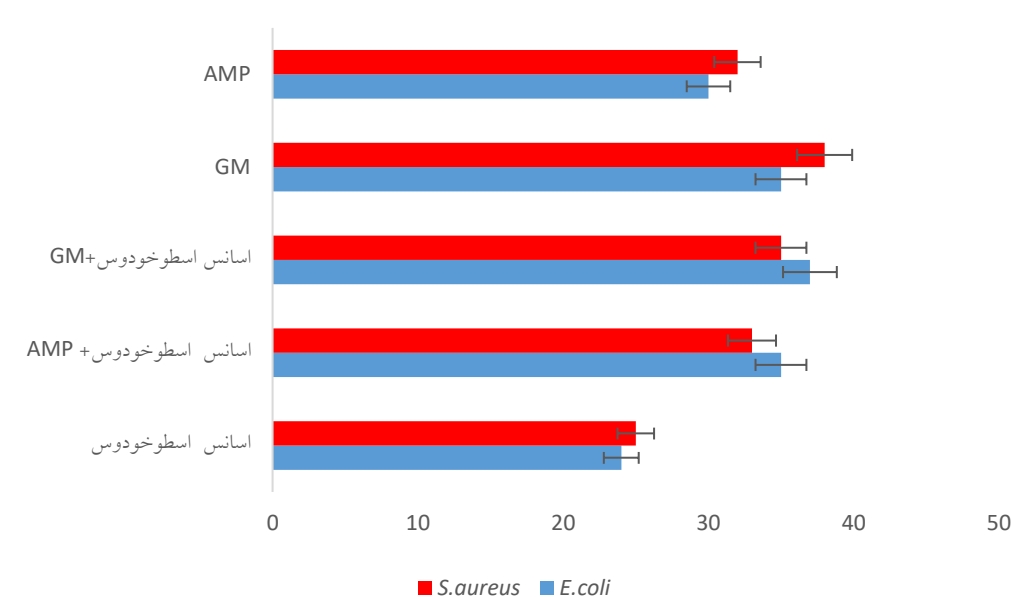
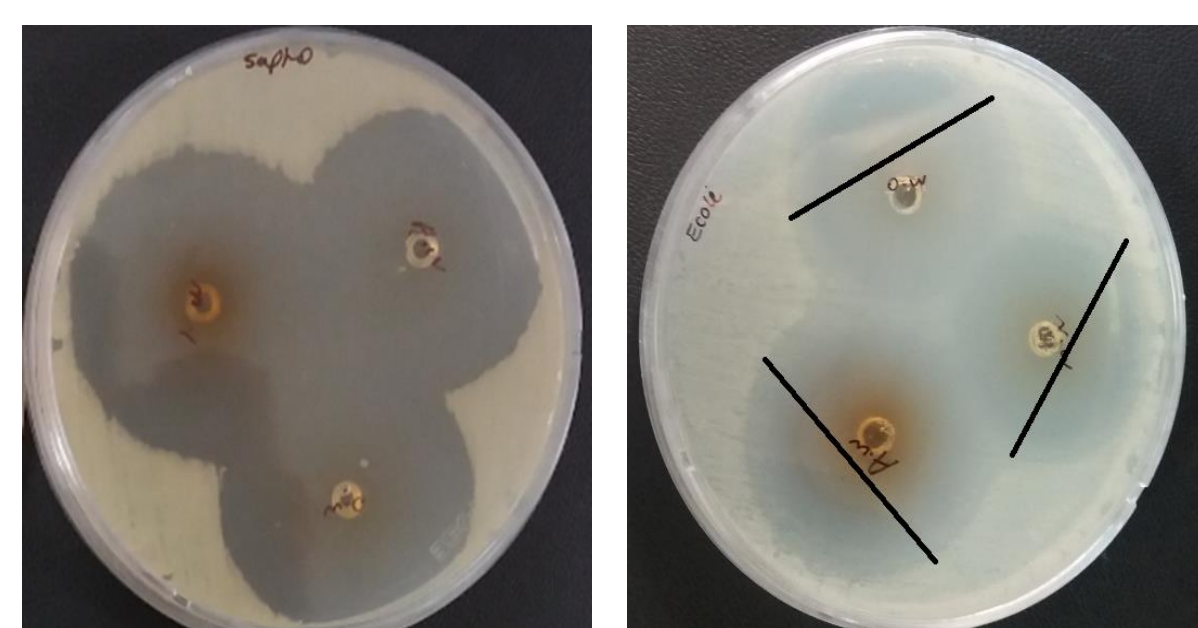
Statement of Problem: Recent years, there has been an increased interest in the use of natural antimicrobial agents. The effective compounds in plant extracts cause their therapeutic properties. Lavandula is one of the native plants of Iran.

Research Purpose: In this research, the antibacterial effect of Lavandula essential oil on the on pathogenic bacteria was measured, and the synergism effect of two probiotic, *Lactobacillus casei* and *Sacharomyces boulardi* was investigated with this essential oil among other things.

Research Method: Lavandula essential oil was prepared with a clevenger. Antimicrobial activity was investigated by disc diffusion and well plate methods. The minimum bacterial inhibitory concentration (MIC) and the minimum bactericidal concentration (MBC) were determined by microdilution method.

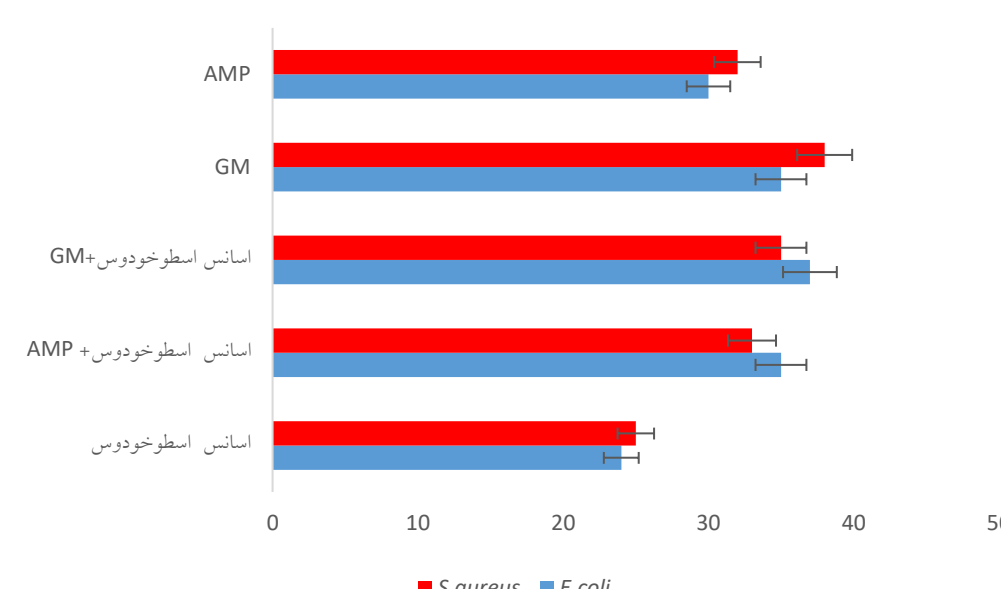


Results and Conclusion : The results showed that Lavandula essential oil created zone of inhibition of 25, 18 and 20 mm and MIC of 6.25, 3.12 and 3.12 on *Staphylococcus aureus* 25923 ATCC, *Pseudomonas aeruginosa* 27853 ATCC and *Escherichia coli* 15223 ATC and each two probiotics also had an antimicrobial effect on bacteria. The synergism effect on *Staphylococcus aureus* was significant. As a result, the effect of this essential oil on Gram positive bacteria was more and a significant synergistic effect was observed with probiotics.



	MIC(mg/ml)	MIC(mg/ml)	MIC(mg/ml)	MIC(mg/ml)
استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس
استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس
استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس
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استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس	استرپتوگاردوس

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	MIC(mg/ml)	MIC(mg/ml)	MIC(mg/ml)	MIC(mg/ml)
سویچه‌ای پاکتری	اسانتس اسطرخونیوس	اسانتس اکلیپتوس AMP+	اسانتس اسطرخونیوس AMP+	اسانتس سنتوخیوس GM+
S. aureus	۱,۲۰	۱,۲۰	۳,۱۲۰	۳,۱۲۰
E. coli	۳,۱۲۰	۱,۲۰	۳,۱۲۰	۳,۱۲۰

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Chemical and therapeutic properties of *Mentha piperita*

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Abstract:

Statement of Problem: Today, chemical drugs are used for treatment of various diseases. However, using of chemical drugs causes negative effects on health human and environment. Therefore, using of medicinal plants can be solved the problems. Research Purpose: Herbal medicinal compounds are applied all over the world as the most natural way to intake of phytochemicals. Today, application of natural products is growing due to their bioactive molecules and antioxidant properties. The properties capable the compounds for neutralizing free radicals slowing the progress of many chronic diseases associated with oxidative stress.

Research Method: Among the different medicinal plants, *Mentha piperita* is one of the herbs most broadly used worldwide due to their medicinal preparations. Its leaf is applied as a remedy for common cold, pharynx, inflammation of the mouth, liver, as well as disorders in the gastrointestinal tract such as vomiting, nausea, cramps, diarrhea, flatulence and dyspepsia. The paper is based on the literature which applied experimental studies for investigation of chemical and therapeutic properties of *Mentha piperita*.

Results and Conclusion: Studies about *Mentha piperita* has confirmed the presence of a wide variety of bioactive compounds causes the plant shows an important role as anti-oxidant, antinociceptive, antimicrobial, antiviral, antitumorigenic and etc. demonstrating its utility in the prevention or treatment of several diseases.

Keywords: *Mentha piperita*, Therapeutic properties, Anti-oxidant, Anti-tumorigenic.

Introduction

Herbal medicinal compounds are used all over the world as the most natural way to intake of phytochemicals. The use of natural products that are rich in bioactive substances is growing along with the demand for plants containing wide range of antioxidant properties and bioactive molecules capable of neutralizing free radicals slowing the progress of many chronic diseases associated with oxidative stress.[1-3].

Among the diversity of plants, *Mentha piperita* (Lamiaceae family) is one of the herbs most widely used worldwide, with a long history of safe use in medicinal preparations. Its leaf is used as a remedy for common cold, inflammation of the mouth, pharynx, liver, as well as disorders in the gastrointestinal tract such as nausea, vomiting, diarrhea, cramps, flatulence and dyspepsia. It is also used as antioxidant, antimicrobial, antiviral, antiinflammatory, and anti-carcinogenic.

Plant is known for having several phytochemicals, including polyphenols that are highly effective antioxidants and are less toxic than the synthetic ones. This property makes it of great interest to the Food Industry, since the phenolic compounds retard the oxidative degradation of lipids improving the quality and nutritional value of food[4,5].

Results and discussion

Table 1: Metabolic effects of *M. piperita*.

Treatment	Effect	Comment	Reference
M. piperita juice in diabetic Wistar rats	Decrease the glycaemia, cholesterol, LDL-c, VLDL-c and triglycerides in the offspring of diabetic rats.	Mentha juice may help prevention of diabetes and its complications in diabetic rats offspring.	[6]
supplementation with M. piperita in Wistar rats	Reduction of blood levels of cholesterol, triglycerides, LDL-c and glucose.	M. piperita may prevent diabetes and its complications.	[7]
M. piperita juice in rats	Reduction of blood lipids and exhibit antioxidant activity.	Mentha juice may help prevention of cardiovascular diseases.	[8]
Menthol and menthone from leavein rats infected by Schistosoma mansoni	Immunomodulatory and anti- inflammatory action in murine model.	Mentha piperita leaves exhibit an immunomodulatory and antiparasitic effect in the experimental murine model of schistosomiasis.	[9]

Acknowledgements

We gratefully acknowledge the financial support from the Research Council of the University of Sistan and Baluchestan.

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Medicinal plants of Sistan and Baluchestan province

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Abstract:

Statement of Problem: Medicinal plants usually have been frequency used as drug source for human and also animals. Traditional botany offers valuable methods for finding new medicinal plants and herbal medicines. However, medicinal plants grow in certain areas. In the present study, medicinal plants of Sistan and Baluchestan province are studied.

Research Purpose: The purpose of the paper is introduction, identification and investigation of the medicinal plants of Sistan and Baluchestan province. Using the compounds can be reduced negative effects of chemical drugs.

Research Method: Medicinal plants have a key role in health supply for both cure and prevention of diseases. The purpose of this research is identification and investigation of some pharmaceutical plants in Sistan and Baluchestan which is applied widely by local people to treat and prevent diseases. This study was carried out on the basis of field survey, information of local people, and documentary research.

Results and Conclusion: In the present study, some pharmaceutical plant species were investigated. Some of these plants that contains fennel, colocynth, ajwain, eucalyptus and etc. was recognized by many people and their therapeutic properties was mentioned. Most of local plants identified in traditional medicine, were applied as diuretic, stomach tonic and wound healing.

Keywords: Medicinal plants, Sistan and Baluchestan province, Diseases.

Background

Many plants and their extracts have been used in traditional medicine to treat infectious and noninfectious diseases in the world (1). These plants have a wide range of antibacterial properties (2). Medicinal plants with antibacterial effects do not have any major side effects on human health and are also inexpensive. During the last 40 years, many researchers in the world worked on plants to find new antibiotics which were clinically effective against drug sensitive-and drug-resistant bacteria (1-6). One of these plants which is important in traditional medicine in Sistan region (southeast of Iran) is *Portulaca oleracea*. *P. oleracea* is an annual plant with fresh, thick, and juicy stems and leaves. This plant has green and red stems and small yellow or white flowers and tiny black seeds which consist of many medicinal properties. This plant grows in most parts of the world. *P. oleracea* has a diuretic effect and also reduces the stomach pain and liver discomforts; the leaf extract is helpful in treating kidney pain (3). *P. oleracea* is also used as an analgesic and antitussive agent and can set the blood sugar in diabetic patients (4). In many parts of the world including southern countries of Asia, this plant is used as a green vegetable (5).

Other biological properties include antiinflammation, muscle relaxation and fever suppression (6). *P. oleracea* is a rich source of omega-3 fatty acids and can prevent heart attacks and improve the immune system in human (7). Okafor in 2014 in Nigeria studied the water extract of aerial parts of *P. oleracea* and showed the presence of steroids, protein, and alkaloids (8).

Dkhil et al. in 2011 in Egypt investigated the antioxidant properties of the *P. oleracea* extract in male mice (9). Uddin et al. in 2012 in Malaysia determined the mineral composition of *P. oleracea* consisting of calcium, iron, zinc, magnesium and potassium, the level of which increase with plant maturation (10). Another study in 2009 showed that the major constituent in the stems and leaves of this plant was water (90.5%). Barbosa et al. reported that the fat content was different ranging from 0.11 to 0.57% and 27 types of leaf fatty acid in the leaf samples were found (11). Nayaka and Londonkar in 2014 evaluated the

antimicrobial effect of hydroalcoholic extract of aerial parts of *P. oleracea* in India (12). In 2011, Londonkar and Nayaka showed the antimicrobial and antifungal properties of ethanol extracts of *P. oleracea* on some bacteria and fungi (5). A study by Ji-Hyun Bae in 2004 showed the antimicrobial effect of *P. oleracea* extracts on foodborne pathogens (13). During these years, researchers have not faced with any signs of significant toxicity in connection with this plant (14).

Acknowledgements

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Investigation of physico-chemical and medicinal properties of purslane

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Abstract:

Statement of Problem: Purslane is a common weed that grows all over the world and is one of the most widespread weed species in summer crops. However, it has great potential to develop as a new crop since its identification as one of the best plant sources of α -linolenic acid, ω -3 fatty acid, as well as some antioxidants such as ascorbic acid, α -tocopherol, β -carotene, and glutathione.

Research Purpose: Purslane is an herbaceous plant consumed in Iran, Italy, the United Kingdom, Greece, Spain, Turkey, China, Malaysia, North Africa, the Philippines, Australia, the United States, Mexico, and Brazil. Purslane provides considerable contributions of polysaccharides, minerals, proteins, fatty acids, terpenoids, alkaloids, phenols, sterols, flavonoids, and vitamins, which together or individually create antioxidant, neuroprotective, antimicrobial, anti-inflammatory, antidiabetic, anticancer, antiulcerogenic, and anticholinesterase properties.

Research Method: New phytochemical compounds have been recognized in purslane through gas chromatography-mass spectrometry (GC-MS), high-performance liquid chromatographic (HPLC), spectroscopic methods, nuclear magnetic resonance (NMR), and etc.

Results and Conclusion: Purslane cultivation is a production alternative as it shows many expectations given its nutritional and nutraceutical properties, low production costs, and high productivity. Therefore, the consumption of the plant in human diets is recommended.

Keywords: Purslane, Physico-chemical, Medicinal properties.

Background

Purslane is a weed commonly found on all continents. It has an enormous potential for infestation mainly due to the large number of seeds produced per plant: up to 500 seeds kg⁻¹ of soil were found, but severe infestations depend largely on the amount and frequency of rainfall in summer (Unger et al. 2019). In addition, it has a particular ability to re-root after cultivation or hoeing, because the fleshy stems remain moist and viable for several days and have a great potential to form roots (Cudney and Elmore 2019). It forms a dense mat covering the soil and preventing the emergence of other seedlings. Its aggressive and prostrate growth has suggested that purslane can be used as a living mulch intercropped with a row crop, for example broccoli, whose yield was not reduced when compared to conventional methods of weed control, such as black plastic mulch, mechanical or chemical control (Ellis et al. 2000). Purslane has received renewed interest since the identification of some of its nutritional and medicinal properties, so much so that it has been described as a “power food of the future” (Levey 2023) and been proposed as a “new crop” (Kumamoto et al. 20200).

Results and discussion

Table 1: Nutritional characteristics of purslane.

Table 1 Nutritional characteristics of purslane (values per kg of fresh mass).		
Compound	Content	References
Water (g)	940 ^a	USDA 2007
Protein (g)	13 ^a	USDA 2007
Total lipid (g)	1 ^a	USDA 2007
Ash (g)	12.5 ^a	USDA 2007
Carbohydrate (g)	34.3 ^a	USDA 2007
Calcium (mg)	650 ^a	USDA 2007
Iron (mg)	19.9 ^a	USDA 2007
Magnesium (mg)	680 ^a	USDA 2007
Phosphorus (mg)	440 ^a	USDA 2007
Potassium (mg)	4,940 ^a	USDA 2007
Sodium (mg)	450 ^a	USDA 2007
Vitamin C (mg)	210 ^a	USDA 2007
	266 ^b	Simopoulos <i>et al.</i> 1992
	840 ^b	Guil <i>et al.</i> 1997
Vitamin A (µg)	660 ^a	USDA 2007
Folate, total (µg)	120 ^a	USDA 2007
α -tocopherol (mg)	122 ^b	Simopoulos <i>et al.</i> 1992
β -carotene (mg)	21-30 ^b	Liu <i>et al.</i> 2000
	19 ^b	Simopoulos <i>et al.</i> 1992
	3.6-6.5 ^c	Liu <i>et al.</i> 2000
Glutathione (mg)	148 ^b	Simopoulos <i>et al.</i> 1992
Total fatty acids (mg)	856 ^a	Cros <i>et al.</i> 2007
	1,620-2,560 ^b	Liu <i>et al.</i> 2000
	590-870 ^c	Liu <i>et al.</i> 2000
	81,800-177,000 ^d	Liu <i>et al.</i> 2000
α -linolenic acid (mg)	481 ^a	Cros <i>et al.</i> 2007
	970-1,600 ^b	Liu <i>et al.</i> 2000
	3,000-4,000 ^b	Simopoulos <i>et al.</i> 1992
	100-290 ^b	Omara-Alwara <i>et al.</i> 1991
	700-1,330 ^b	Palaniswami <i>et al.</i> 2001
	70-210 ^c	Liu <i>et al.</i> 2000
	35,300-68,800 ^d	Liu <i>et al.</i> 2000

^a: Whole plant; ^b: Leaves; ^c: Stems; ^d: Seeds

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The effect of cotton plant extract in the treatment of leishmaniasis

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Statement of Problem: Leishmaniasis is one of the 10 most important diseases of the World Health Organization with health problems in more than 90 countries. The present human study was performed to evaluate the therapeutic effect of cotton plant on cutaneous leishmaniasis lesion.

Research Purpose: evaluate the therapeutic effect of cotton on cutaneous leishmaniasis.

Research Method: This double-blind randomized controlled clinical trial was performed on 88 cases of leishmaniasis wounds between the ages of 6 and 60 years. Patients were randomly divided into two groups of 44 cases. two groups received conventional treatment. In addition to the usual treatment (glucantime), the first group received cotton and the second group or control group received placebo. Glucantime treatment was performed according to national instructions and treatment with cotton plant extract was performed twice a day topically. Clinical evaluation of wound surface was measured in weeks 1 to 4, 8 and 12 and the effect of these topical products was evaluated by statistical tests.

Results and Conclusion : The results of the present study showed that the surface of lesion before the intervention and in the first to fourth weeks after the intervention was not significantly different between the two groups (P-value> 0.05). But the surface of lesion in the Intervention group in the eighth and twelfth weeks was lower than the control group (P-value <0.05). This study showed that the improvement of leishmaniasis lesion using topical cotton plant mark in the eighth and twelfth weeks after the intervention was significantly more than the control group . However, studies with a longer period and with a larger sample size and better treatment formulation are needed for better treatment.

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Gum tragacanth of *Astragalus* : a natural substance with potential medicinal properties

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Statement of Problem:

Gum tragacanth extracted from *Astragalus* spp. has a long history of use in traditional medicine. It has been used to treat a variety of conditions, including coughs, sore throats, diarrhea, and even snake bites. Its therapeutic properties are thought to be due to its ability to form a protective coating on the mucous membranes, which can help to soothe inflammation and irritation. One of the most well-known uses of gum tragacanth in traditional medicine is to treat respiratory conditions such as coughs and bronchitis. It is believed to soothe inflammation in the respiratory tract and reduce coughing. Additionally, gum tragacanth is sometimes used to treat sore throats and other throat irritations. Gum tragacanth has also been used as a natural remedy for diarrhea. Its ability to form a protective layer on the intestinal lining can help to soothe inflammation and reduce the frequency of bowel movements. However, it's important to note that more research is needed to fully understand its effectiveness for this purpose. Preliminary research has suggested that gum tragacanth may have potential as an anti-inflammatory and anti-cancer agent. Nevertheless, further studies are necessary to confirm these findings and determine the appropriate dosage and safety profile.



Research Purpose:

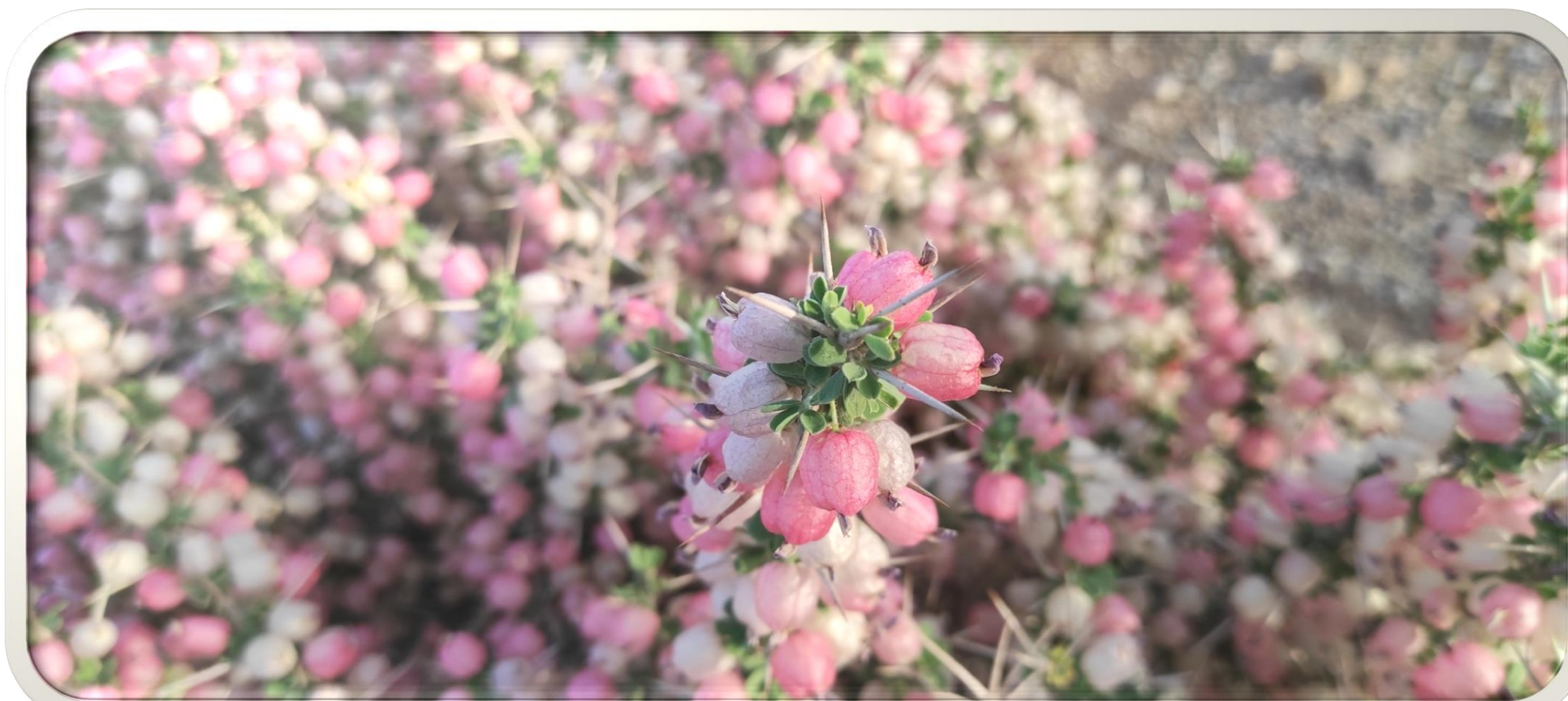
The aim of the overview summary, which is to identify and list the *Astragalus* species that produce gum tragacanth in Iran while highlighting their medicinal properties in traditional and modern medicine.

Research Method:

To identify the *Astragalus* species that produce gum tragacanth in Iran and their medicinal properties, we conducted a literature search using scientific papers, books, and local knowledge. The sources we consulted allowed us to compile a list of the most well-known producers of gum tragacanth in Iran.

Results and Conclusion:

Astragalus L. (Fabaceae) is the world's largest genus of flowering plants, comprising approximately 3000 species. With over 800 species, Iran is one of the most important centers of diversity for this genus, especially in high-elevation areas with harsh climates. These species exhibit thorny or herbaceous characteristics, and more than 550 of them are endemic to Iran. The genus is mainly distributed in the Iranian-Turanian region, including the Zagros, Alborz, and Azerbaijan mountains, as well as scattered elevations throughout central Iran. Some thorny *Astragalus* taxa produce gum tragacanth, which is known as white and yellow gum tragacanth and is popular in Iran and among consumers. In particular, the *Platonychium*, *Rhacophorus* and *Brachycalyx* sections includes several well-known gum tragacanth-producing species. While gum tragacanth has a long history of use in traditional medicine, there is still much to be explored in terms of its potential medicinal and therapeutic properties. Research into the properties of this natural gum has shown promise in areas such as wound healing, anti-inflammatory effects, and as a prebiotic for gut health. Additionally, gum tragacanth has been found to have potential applications in the food and pharmaceutical industries, such as in the formulation of drug delivery systems and as a stabilizing agent in food products. With continued research, the full extent of the benefits of gum tragacanth may be further uncovered, offering potential opportunities for its use in various fields.



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مقدمه :

سرکه محصول تخمیر شده‌ای است که حدود ۵-۲۰ درصد اسید استیک را تشکیل می‌دهد و از تخمیر الکل به کمک گونه‌های استوباکتر تهیه می‌شود. سرکه سنتی در یک تخمیر دو مرحله‌ای تولید می‌شود. ابتدا قندهای ساده در مواد خام توسط مخمرها به اتانول تبدیل می‌شود و متعاقب آن باکتری‌های استیک اسید، اسید استیک و انواع دیگری از متابولیت‌ها را تولید می‌کنند (۱) علاوه بر این ترکیبات زیست فعال سرکه با انواع فعالیت‌های ضد میکروبی و آنتی اکسیدانی مرتبط است (۲). اسیدهای آلی خوراکی نظیر اسید استیک، گلوکونیک اسید و اسید لاکتیک در طی تخمیر توسط انواعی از میکروب‌ها تولید می‌شود که به عنوان نگهدارنده و طعم دار کردن مواد غذایی استفاده می‌شود (۳).

فرایند تولید سرکه



هدف پژوهش:

در ایران سالانه مقدار زیادی سرکه سیب به روش‌های سنتی تولید می‌شود، اما هنوز وجود برخی از باکتری‌های بیماری‌زا مهم مانند **باکتری‌های اسپورزا و خانواده انتروباکتریاسه** در مراحل مختلف تولید بررسی نشده است. علاوه بر این، هنوز تفکر عمیقی در مورد تأثیر شرایط فیزیوشیمیایی بر پویایی باکتری‌های بیماری‌زا در طول تولید سرکه وجود ندارد.



نتایج و نتیجه‌گیری:

بر اساس نتایج به‌دست‌آمده، مشخص شد که کلیفرم‌ها فقط در مرحله اول تخمیر وجود دارند.

در طول ماه اول، گونه‌های کلبسیلا و گونه‌های سیتروباکتر با روش بیشترین تعداد احتمالی باکتری‌ها (MPN) قابل تشخیص بودند.

اما تعداد این باکتری‌ها پس از ۴۵ روز به طور ناگهانی کاهش یافت.

به نظر می‌رسد کاهش PH و افزایش غلظت کل اسید آلی ممکن است باعث مرگ کلیفرم‌ها شود.

روش تحقیق:

در این پژوهش سرکه سیب را در شرایط کنترل شده در دمای ۳۰ درجه سانتی‌گراد تولید کردیم. علاوه بر این، از روش‌های تولید خوب (GMP) استفاده شد و در فواصل زمانی مشخص، نمونه‌ها در شرایط آسپتیک جمع‌آوری شدند. سپس محتمل‌ترین تعداد کلیفرم‌ها توسط محیط‌های کشت مختلف تعیین شدند.

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Medicinal and nutritional properties of honey from the perspective of medical science and traditional medicine-Islamic

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نتایج و بحث

خواص درمانی عسل بر زخم‌ها

آنتی اکسیدان‌های موجود در عسل می‌توانند زنجیاسیب می‌رسانند، از بین ببرند. علاوه بر این، اثرات ضد التهابی، ضد میکروبی و مرطوب کننده عسل می‌تواند رگ زایی و گردش اکسیژن را افزایش داده و منجر به بهبود زخم شود (Laila et al., 2019). عسل باعث بازسازی سلول‌های اپیتلیال زخم‌ها می‌شود و به این ترتیب سرعت بهبود زخم‌ها افزایش می‌یابد (Nasir et al., 2010). عسل باعث تحریک رشد بافت‌ها، سنتز کلاژن و رشد جدید رگ‌های خونی در زخم‌های ایجاد شده می‌گردد (Nazeri, 2015). عسل خالص باعث کاهش پروستاگلاندین-E، پروستاگلاندین آلفا-۲ و همچنین غلظت ترومبوکسان B2 در خون می‌گردد و باعث تسکین درد می‌شود (Mirbagher Ajorpaz et al., 2011). در طی بررسی کاربرد حجامت و عسل جهت درمان بیماری زخم پای آرتریت روماتوئید مقاوم به درمان‌های معمولی به مدت سه ماه مشاهده شد که ۹۳/۳٪ علائم زخم بهبود یافت و تنها در حدود ۶/۷٪ از زخم‌ها احتیاج به جراحی داشت (Fehr et al., 2016). عسل قرن‌هاست که توسط پزشکان سنتی در سراسر جهان جهت درمان بیماری‌های چشم در هند، سرفه و گلو درد در بنگلادش، زخم پا در غنا و سرخک در نیجریه مورد استفاده قرار می‌گیرد (El-Soud and Helmy, 2012). در طب سنتی یونانی و آیورودا از عسل به عنوان ضد میکروب، بهبود زخم، ضد ویروس، بیماری‌های چشم، سرفه، دیابت و التهاب استفاده شده است (Jahangir et al., 2020).

خواص درمانی عسل بر بیماری‌های شایع التهاب-گوارشی

ترکیبات مختلف فعال زیستی عسل دارای خاصیت ضد التهابی، استرس اکسیداتیو، هیپرپلازی سینوویال و رگ‌زایی در کاهش آسیب‌های داخل مفصلی است (Yuan et al., 2020). مصرف عسل طبیعی رقیق در انسان باعث کاهش غلظت پروستاگلاندین E2، پروستاگلاندین F2α و ترومبوکسان B2 در پلاسمای افراد سالم می‌شود (Martinez-Armenta et al., 2021). نقش بیولوژیکی VLN مشتق شده از عسل باعث مهار فعال سازی التهاب NLRP3 و سیگنالینگ NF-kB به عنوان یک ضد التهابی قوی فعالیت دارد (Chen et al., 2021). در زمان مصرف برای بهبود چندین بیماری انسانی از عسل استفاده می‌کردند، یونانیان از عسل برای افزایش طول عمر و انرژی‌زایی، چینی‌ها و روس‌ها به عنوان دارویی سنتی از عسل یاد کردند، در مسلمانان جهت بیماری‌های التهاب روده، ترمیم بافت‌های عضلانی، حرکت‌های غیر عادی روده (abnormal bowels movement)، اشتهای غیرعادی و عدم تعادل مایعات بدن استفاده می‌شوده است (Khan et al., 2014). عسل خاصیت ضد قارچی در مقابل بسیاری از گونه‌های قارچی از جمله اسپرزیلوس، پنی‌سیلین و برخی از درماتوفیت‌ها دارد (Kumar et al., 2010). در قرون وسطایی در کشورهای مختلف اروپایی مانند ایرلند، آلمان و فنلاند از عسل طبیعی به عنوان داروی تسکین دهنده برای تسریع بهبود زخم‌ها در سربازان در جنگ دوم بالکان در سال ۱۹۱۳ استفاده می‌کردند. همچنین از عسل برای درمان سرفه، آب مروراید و آنفولانزا، آب سیاه استفاده شده است (Altman, 2010). عسل به عنوان ضدبیوتیک، برای تب حصبه، دیابت، زخم داخلی و خارجی، زخم معده، زخم اثنی عشر، استقراغ، حالت تهوع، بیماری‌های کبدی، فشارخون و بیماری‌های پوستی استفاده شده است (Mohamad et al., 2014). در ایران براساس طب سنتی - اسلامی (Reyshahry, 2010) از ترکیب عسل و سیاهدانه (دوسین) جهت کاهش علائم دستگاه گوارش مانند شکم درد، نفخ و اسهال استفاده می‌گردد (Hashem-Dabaghian et al., 2016).

خواص درمانی عسل بر بیماری سرطان

پلی‌فنول‌های مختلف در عسل مانند کافئیک اسید، فنیل استر کافئیک، کریسین، گالاتگین، کوئرستین، آستین، کامپوفول، پینوکامبرین، پینوبانکسین و آپیکنین به عنوان داروهای دارویی امیدوار کننده در درمان سرطان تکامل یافته‌اند (Khalil et al., 2010). اسید کافئیک فنیل استر ((caffeic acid phenyl ester (CAPE)) یک ترکیب فنولیک در عسل و موم است که سبب مهار مسیرهای مهم سیگنال دهی در رشد، مهار تکثیر و بقای سلول های سرطانی شده و این ترکیب فنولی باعث از بین بردن نوروفیبرومها (Neurofibromatosis) که نوعی سرطان در سیستم عصبی، عضلانی و استخوان‌ها و پوست است که از نخاع به سایر قسمت‌های بدن گسترش می‌یابد، می‌گردد (Al Qubaisi, 2015). کامفورل جدا شده از عسل دارای خاصیت ضد سرطانی و ضد التهابی است (Ghaffari et al., 2012). سیاری از غذاها از سبزیجات، میوه‌ها و گل‌ها تهیه می‌گردند و به دلیل خاصیت درمانی این گیاهان در بیماری‌های مزمن مثل بیماری‌های قلبی-عروقی و سرطان استفاده می‌شوند، در مورد نوشیدنی‌های حلال؛ اسم عسل در آیه ۶۹-۶۸ در سوره نخل و در مورد اثر بهبود بخش آن مطالبی ذکر شده است (Salim, 2014). در اینکه عسل خواص غذایی و درمانی فراوان دارد، جای تردید نیست همان گونه که اشاره صریح قرآن به «شفا» بودن عسل فیه شفاءً للأناس یک مطلب علمی است قرآن کریم بر آن مهر تأیید زد(رضائی اصفهانی، ج۲، ص۴۱۶) حضرت رسول(ص) فرمودند: خوردن عسل شفاء هر بیماری است (طبرسی،ص۱۳۱).

خواص درمانی عسل بر بیماری‌های معز

در طی یک بررسی آزمایشگاهی مشخص شد که نوتروپیک ها(Nootropic) در عسل وجود دارند که با خاصیت آنتی‌اکسیدانی باعث کاهش پیری و اختلالات عصبی می‌گردد، هم‌چنین بیان شد که خاصیت درمانی عسل در برابر تنش‌های اکسیداتیو باعث حفظ ساختار سلولی به ویژه سلول‌های مغزی می‌گردد که باعث حفظ عملکردهای مغز و توانایی ادراک (Cognitive) می‌شود (Azman and Zakaria, 2019). کولین در عسل برای عملکرد قلب-عروق، مغز و ترمیم گشای سلولی ضروری است، در حالی استیل کولین به عنوان انتقال دهنده‌های عصبی عمل می‌کند (Arrosyid et al., 2021). در قومیت‌های سنتی و باستانی این باور وجود دارد که عسل یک مکمل غذایی تقویت کننده حافظه است، عسل جزء مهمی از براهما راسایان، فرمولاسیون آیورودا است که برای افزایش طول عمر و بهبود حافظه، هوش، تمرکز و قدرت بدنی تجویز می‌شود (Mishra, 2011). در روایات اسلامی تأکید فراوانی بر مصرف عسل شده است چنان که امام رضا(ع) فرمودند: کسی که می‌خواهد فراموشیش کم شود هر روز سه قطعه زنجبیل پرورده باعسل بخورد(امام رضا(ع)، ص۲۶۱) یا در روایتی پیامبراکرم(ص)فرمود: جسم با سه چیز شاد می‌شود و رشد می‌کند: عطر و لباس نرم و خوردن عسل(متسغفری، ص۳۷) همچنین پیامبراکرم (ص)فرمود: هر کس حافظه بخواهد، عسل بخورد (متسغفری،ص۳۸) این گونه روایات تاییدی بر تأثیر عسل بر سلامتی است.

خواص درمانی عسل بر بیماری زنان

در طی بررسی اثر سه داروی فنیوتئین (phenytoin)، عسل و مسکن (placebo) در جهت بهبود جهت درمان ناحیه اپیزوتومی (episiotomy) پس از زایمان در گروه ۱۲۰ نفر از زنان به مدت ۲۴ ساعت، ۷ و ۱۴ روز مشخص شد که بین سطح درمانی سه گروه برای روز هفتم پس از زایمان اختلاف معنی‌داری وجود داشت و سطح بهبودی در گروه عسل نسبت به گروه مسکن پایین‌تر بود اما، سطح بهبودی بین سه گروه پس از ۱۴ روز تفاوت معنی‌داری نداشت (Lavaf et al., 2017). در طی بررسی مقایسه بین اثرات استروژن-پروژسترون درمانی و عسل (Tualang) در زنان یائسه مشخص شد که، استفاده از عسل به مدت ۱۶ هفته منجر به کاهش تنش اکسیداتیو از طریق افزایش آنتی‌اکسیدان‌های کاتالاز یا گلووتاتیون پراکسیداز و کاهش سطح ۴-هیدروکسی‌نوال (HNE-4) شد، در نهایت بیان شد که خاصیت استروژنیک عسل در مقابل یوکی استخوان یائسگی حالت محافظتی ایجاد می‌کند (Shafin et al., 2014). در طی بررسی تأثیر تغذیه در باروری زنان در طب سنتی ایران بیان شد که ورزش، طب فشاری، طب سوزنی، آرامش، ارتعاش و گرما، آویشن، چای بابونه، رازیانه، زنجبیل، شوید، کرفس، زعفران، انیسون، گل پادرنجیویه مریم، سنبل الطیب، عصاره نعنایع، عسل خالص در درمان محافظت از دیسمنوره اولیه موثر است (Dehkordi et al., 2015). استفاده از رژیم غذایی و مکمل غذایی همراه باعسل، روغن زیتون، آنتی‌اکسیدان‌ها، دانه‌های رازیانه و زنجبیل بیشترین موارد استفاده در طب مکمل و پزشکی جایگزین جهت درمان سرطان پستان در زنان بود و هم‌چنین خواندن قرآن کریم و دعا، روش‌های مثبت اندیشی و آرامش بیشترین روش‌های مورد استفاده در طب مکمل یا سنتی بود (Alsharif and Mazanec, 2019).

نتیجه‌گیری

در دوران مصر باستان، یونان، طب چین، هندی و اسلامی از عسل به عنوان داروی مکمل یاد شده است. در قرآن کریم (سوره نحل)، دین مسیحیت (Exodus, Judges, Mathew as well as Proverbs) و در کتاب مقدس یهودیت به خواص و اهمیت عسل اشاره شده است. به علاوه، سازمان غذا و دارویی آمریکا (FDA) چندین محصول دارویی مبتنی بر عسل را نیز تأیید نموده است. در نهایت با توجه به ترکیبات فتوشیمیایی عسل که سبب خاصیت ضد التهابی، ضد‌سرطان، بهبود زخم‌ها، بیماری‌های گوارشی، مغز و بیماری‌های زنان می‌گردد به عنوان عنوان یک غذا و دارویی سنتی-مکمل همراه با پزشکی نوین توصیه می‌شود.

چکیده:

سابقه و هدف: ترکیبات فعال زیستی عسل جهت درمان زخم، سرفه و عفونت‌های پوستی استفاده می‌شود، هم‌چنین با استفاده از آنتی‌اکسیدان و مواد ضد التهابی عسل به عنوان یک محرک بیولوژیکی استفاده می‌گردد. عسل طبیعی دارای ترکیبات مهم درمانی مانند قندها، اسیدهای آمینه، پروتئین‌ها، آنزیم‌ها، آنتی‌اکسیدان‌های فلاونوئیدی، ویتامین‌ها و ترکیبات فنلی است که برای سلامتی و پیشگیری از بیماری‌های انسانی مانند زخم‌های معده‌ای-روده، اختلالات دستگاه گوارش، نقص سیستم ایمنی بدن، اختلالات چشمی، استرس‌های اکسیداتیو و سرطان استفاده می‌شود. هدف از این پژوهش، بررسی خواص دارویی و تغذیه‌ای عسل در بیماری‌های بالینی مشترک بیان شده در پزشکی نوین و طب سنتی-اسلامی است.

مواد و روش‌ها: در این مطالعه مروری، متون برگزیده طب سنتی اسلامی، روایات طبی و تمامی مقالات ثبت شده در پایگاه‌های اطلاعاتی علمی معتبر شامل PubMed, Googel Scholar, Makhzan-Al-Advieh, Quran, Magiran و Ovid طی سال‌های ۲۰۱۰ تا ۲۰۲۱ در آزمایشات بالینی انسان و بیماری‌های مشترک (زخم، التهاب-گوارشی، سرطان، مغز و زنان) در طب نوین پزشکی و سنتی-اسلامی جستجو و بررسی شد. هم‌چنین قرآن کریم و کتب روایی مورد بررسی قرار گرفت. در نهایت ۱۱۵ مقاله در این اثر انتخاب گردیدند و از بین مقالات منتخب؛ تعداد ۷۴ مقاله که به صورت مشترک بر بیماری‌های زخم، التهاب- گوارشی- سرطان، مغز و زنان پرداخته شده‌بود؛ مطالب مربوط به اثرات بررسی خواص دارویی و تغذیه‌ای عسل در بیماری‌های بالینی مشترک بیان شده در پزشکی نوین و طب سنتی-اسلامی مورد بحث و بررسی قرار گرفت.

یافته‌ها: با توجه به خواص آنتی‌اکسیدان‌های فلاونوئید، پلی‌فنول، ویتامین C و مونوفنولیک‌ها و پراکسید هیدروژن موجود در عسل جهت بهبود زخم‌ها، التهاب-گوارشی، سرطان، مغز و زنان در پزشکی نوین و طب سنتی اسلامی توصیه شده است.

نتیجه‌گیری: این پژوهش مروری حاکی از اهمیت خاصیت آنتی‌اکسیدانی نظیر فلاونوئیدی و پلی‌فنولی عسل است که برای سلامتی انسان‌ها و سبک زندگی سالم بسیار ضروری و مفید است. هم‌چنین به عنوان یک آنتی‌بیوتیک قوی در مقابل باکتری‌ها، ویروس‌ها و قارچ‌های بیماری‌زا عمل می‌کند، بنابراین استفاده از عسل به عنوان یک داروی طبی پیشنهاد می‌گردد.

کلمات کلیدی: التهاب، سرطان، زخم، زنان و مغز، عسل، روایات طبی، متون اسلامی

مقدمه:

عسل محلول بسیار غلیظ و چسبناک که متشکل از حدود ۸۰٪ قندها، ۱۷٪ آب و ۳٪ سایر مواد تشکیل دهنده است، مهم‌ترین قندهای عسل شامل فروکتوز و گلوکز می‌باشد. به علاوه، دارای مقادیر بسیار جزئی مونوساکاریدها، دی‌ساکاریدها و الیگوساکاریدهای مانند ساکارز، مالتوز، ایزومالتوز، نیگروز، تورانوز و مالتوز است (-Minden, Birkenmaier and Bowlin, 2018). ترکیبات غیر قندی عسل شامل فلاونوئیدها (فلاونول‌ها، فلاون‌ها، فلاوانول‌ها، فلاوانون‌ها، آنتوسیانیدین، کالکون‌هاو ایروفلاون)، فلیک و سایر اسیدهای آلی، مواد شبه کاروتنوئیدها، پروتئین‌ها، اسیدهای آمینه (پرولین آمینو اسید اصلی است که نیمی از کل اسیدهای آمینه آزاد را تشکیل می‌دهد)، مواد معدنی (کلسیم، مس، آهن، منیزیم، منگنز، فسفر، پتاسیم، سدیم و روی)، ویتامین‌ها (به ویژه ویتامین C، ویتامین B6، تیامین، نیاسین، ریبوفلاوین و پانتوتنیک اسید) و رنگدانه‌ها می‌باشد (Hossain et al., 2021). قرن‌هاست که از عسل به عنوان داروی طبیعی برای درمان طیف وسیعی از بیماری‌ها استفاده گردیده است، در دوران مصر باستان و یونان، در طب چین، هندی و اسلامی و به عنوان داروی مکمل مصرف شده است. هم‌چنین لوح‌های سفالی سومری (تقریباً ۶۲۰۰ سال قبل از میلاد)، پاپیروس مصر (۱۹۰۰-۱۲۵۰ پیش از میلاد) ، ودا (کتاب هندو که حدود ۵۰۰۰ سال قدمت دارد)، تلمود، قرآن کریم، کتاب مقدس (در عهد عتیق و عهد جدید)، کتاب‌های مقدس هند، چین، ایران و مصر و نوشته های پزشک یونان باستان بقراط (۴۶۰-۳۵۷ پیش از میلاد) اشاره گردیده است که از عسل به عنوان دارو استفاده نموده‌اند (Saranraj et al., 2016). در سنت‌های یهودی-مسیحی/اسلامی معتقد بودند که عسل هدیه‌ای از خداوند است که روح و روان را تازه می‌کند. پزشک یونان باستان بقراط استفاده از مخلوط‌های پایه عسل را برای درمان بیماری های مختلف مانند تب، درد و زخم توصیه کرده است. مردم چین از عسل در بسیاری از روش‌های درمانی سنتی استفاده کردند، در زمان‌های اخیر، سربازان روسی و چینی از عسل برای بهبود زخم‌های جنگ استفاده می‌کردند. استفاده از عسل موجود در طب سنتی مدرن برای درمان سرفه و گلودرد، علائم خشکی چشم، زخم پا، زخم، گوش درد، زخم معده و یبوست رایج است (Hossain et al., 2021).

در قرآن کریم یک سوره کامل به نام نحل (زنبور عسل) وجود دارد، که اهمیت و مفید بودن عسل برای سلامت انسان و نیازهای غذایی از دیدگاه خداوند متعال را بیان می‌نماید (Kamarulzaidi, et.al., 2014). در روایات توصیه به استفاده از عسل فراوان آمده است مانند این روایت که حضرت رسول(ص)فرمودند: هر که خواهد در زمستان زکام نشود هر روز سه لقمه عسل بخورد(مجلسی، ج۶؛ ص ۲۵۷) و یا در حدیثی دیگر پیغمبر (ص) فرمود: عسل چه خوب خوردنی است، (نبروی) دل را حفظ می کند و سردی سینه را می‌برد. (طبرسی، ج۱، ص ۳۱۴).

مواد روشها:

در این مطالعه مروری، متون برگزیده طب سنتی اسلامی، روایات و تمامی مقالات ثبت شده در پایگاه‌های اطلاعاتی علمی معتبر شامل PubMed, Googel Scholar, Makhzan-Al-Advieh, Quran, Magiran و Ovid با در نظر گرفتن کلید واژه‌های Modern Science, Islamic Traditional Medicine, Medicinal Plants, Wound, Health Benefits, Honey, Holy Quran, Women's disease و Brain طی سال‌های ۲۰۱۰ تا ۲۰۲۱ در آزمایشات بالینی انسان و بیماری‌های مشترک (زخم، التهاب-گوارشی، سرطان، مغز و زنان) در طب نوین پزشکی و سنتی-اسلامی جستجو و بررسی شد. هم‌چنین قرآن کریم و کتب روایی مورد بررسی قرار گرفت. در نهایت ۱۱۵ مقاله در این اثر انتخاب گردیدند و از بین مقالات منتخب؛ تعداد ۷۴ مقاله که به صورت مشترک بر بیماری‌های زخم، التهاب-گوارشی-سرطان، مغز و زنان پرداخته شده‌بود؛ مطالب مربوط به اثرات بررسی خواص دارویی و تغذیه‌ای عسل در بیماری‌های بالینی مشترک بیان شده در پزشکی نوین و طب سنتی-اسلامی مورد بحث و بررسی قرار گرفت.

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Visual arts and medicine and health

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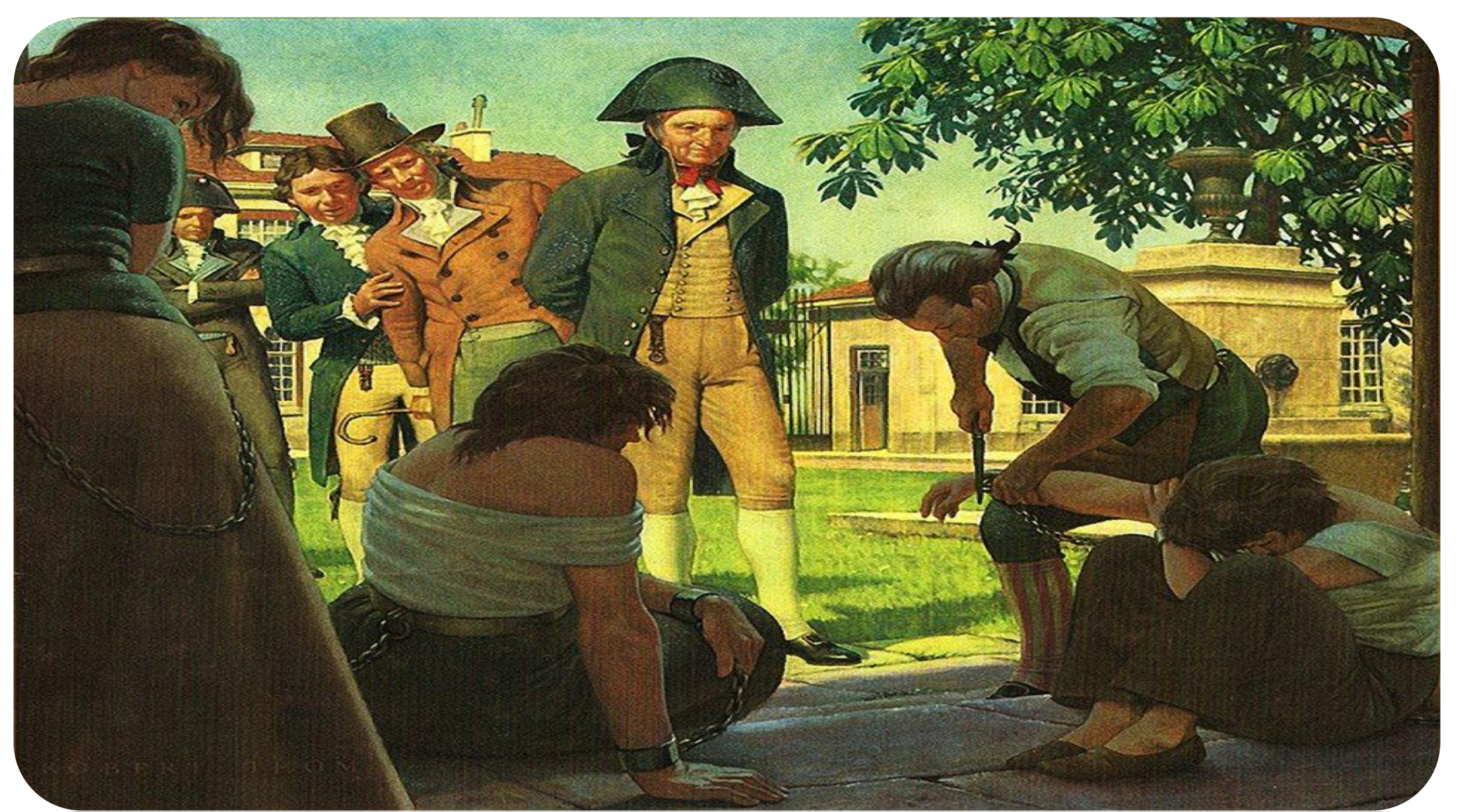


رابطه علم بیولوژی و هنر یک موضوع فلسفی پیچیده است که در طول تاریخ، بسیاری از فیلسوفان و هنرمندان به آن پرداخته‌اند. برخی فیلسوفان معتقدند که بیولوژی قادر است به ما کمک کند تا بهتر درک کنیم چرا انسان‌ها به خصوص به آثار هنری علاقه دارند. هنر نیز می‌تواند به درک علمی از جهان زیستی کمک کند. در نهایت، برخی فیلسوفان و هنرمندان معتقدند که هنر و علم بیولوژی هر دو به دنبال درک و توصیف جهان هستند، هر یک به روش خودشان. بنابراین، این دو حوزه می‌توانند با یکدیگر همکاری کنند تا به بهترین نتیجه برسند. - "هنر و علم هر دو نوعی هدیه به انسانیت هستند؛ هنر برای نشان دادن زیبایی و عمیقاً درک شدن آن، و علم برای درک واقعیت و عمل بهتر در آن." - ریچارد فاینمن

در این مقاله، به بررسی رابطه علم بیولوژی و هنرهای تجسمی مثل نقاشی‌های تاریخی خواهیم پرداخت. مجموعه "نقاشی تاریخ پزشکی" از رابرت آلن تام، شامل ۴۵ اثر نقاشی است که در طول تاریخ پزشکی ساخته شده‌اند. این اثرها، از دوران باستان تا رنسانس، برای بهبود شناخت بیماری‌ها و درمان آنها ساخته شده‌اند. در ادامه، به برخی از این اثرها و تحلیل‌های تام در مورد آنها اشاره خواهیم کرد. در کل، رابطه بین علم بیولوژی و هنر یک موضوع پیچیده است که به صورت گسترده‌ای در طول تاریخ مورد بحث قرار گرفته است. هر دو حوزه می‌توانند به یکدیگر کمک کنند تا به درک بهتری از جهان و موجودات زنده در آن برسیم و به خلق آثاری با ارزش و شگفتی کمک کنند. - "هنر، چیزی بیش از علم است؛ چون علم تنها چیزهایی را توضیح می‌دهد که هستند، در حالی که هنر چیزهایی را نشان می‌دهد که هستند و نیز چیزهایی را که نیستند." - آلبرت انیشتین

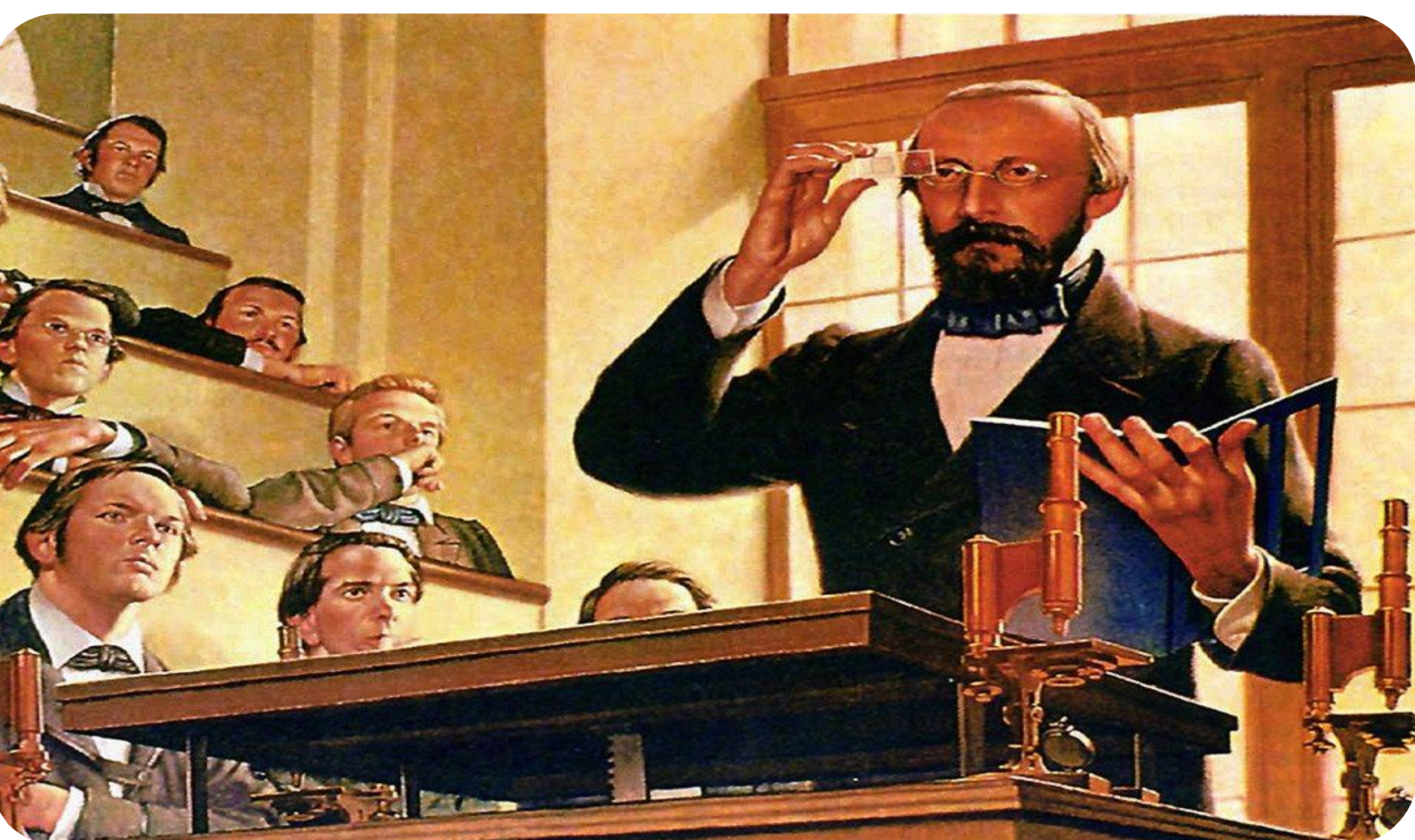
منابع: <https://www.dailyartmagazine.com/history-of-medicine-in-art/>

<https://imgur.io/gallery/qXSrn>



دکتر بنجامین رش (۱۷۴۵-۱۸۱۳) در طول وبای تب زرد در سال ۱۷۹۳ در فیلادلفیا، پایتخت ایالات متحده آمریکا، با شجاعت حرفه‌ای، اخلاقی و جسمانی خود مواجه شد. ساکنانی که می‌توانستند فرار کردند، کسانی که نمی‌توانستند، به دست بیماری نابود شدند. وحشت و هیستری تمام شهر را فراگرفت. صدها نفر روزانه درگذشتند. دکتر رش در آنجا ماند، به بیماران مراقبت کرد و دو حمله به تب را شخصاً تحمل کرد. با وجود اینکه درمان‌های قهرمانانه او شدیداً مورد انتقاد قرار گرفت، او محکم ماند. او یکی از برجسته‌ترین پزشکان تاریخ آمریکا بود، در امضای تعهد استقلال، رهبر اولین دانشکده پزشکی کشور بود و به عنوان اولین بزرگ پزشک آمریکا شناخته شد.

پدر روانپزشکی، پزشک فرانسوی فیلیپ پینل، در سال ۱۷۹۵، دستبندها و زنجیرهای زنان دیوانه را در بیمارستان بزرگ سالپتریر در پاریس برداشت. دو سال قبل، او به همین شکل مردان دیوانه را در بیکتره آزاد کرده بود. با وجود مخالفت‌های سیاسی و پزشکی و عدم اطمینان در زندگی در دوره‌ی پررونق انقلاب فرانسه، پینل در جایگزینی ظلم و بی‌انسانیت با فهم، مهربانی و درمان منطقی پایدار شد. موفقیت او در درمان و تسکین بیماران مبتلا به بیماری‌های روانی، چشم اندازهای جدیدی را برای تحقیقات و عمل در روانپزشکی ایجاد کرد.



در سال ۱۸۵۵ و در سن سی و چهار سالگی، دکتر رودلف فیرخو (۱۸۲۱-۱۹۰۲) به عنوان استاد دانشگاه وورتسبورگ در آلمان، نظریه‌ی پاتولوژی سلولی خود را معرفی کرد. در حین سخنرانی و نمایش در بیمارستان وورتسبورگ، این استاد کوچک قد از میکروسکوپ استفاده کرد تا دانشجویان را متقاعد کند که سلول‌ها از سلول‌های دیگر تولید می‌شوند و بیماری از اختلال سلولی به دلیل آسیب یا تحریک ناشی می‌شود. در سال‌های بعد، فیرخو در برلین به رهبری افکار پزشکی جهانی ادامه داد و به تدریس، پژوهش، نوشتن، ویرایش، کشف زمینه‌های جدید و خدمت به جامعه خود به صورت سیاسی پرداخت تا سال ۱۹۰۲ که درگذشت، به عنوان یکی از پزشکان بزرگ شناخته شود.

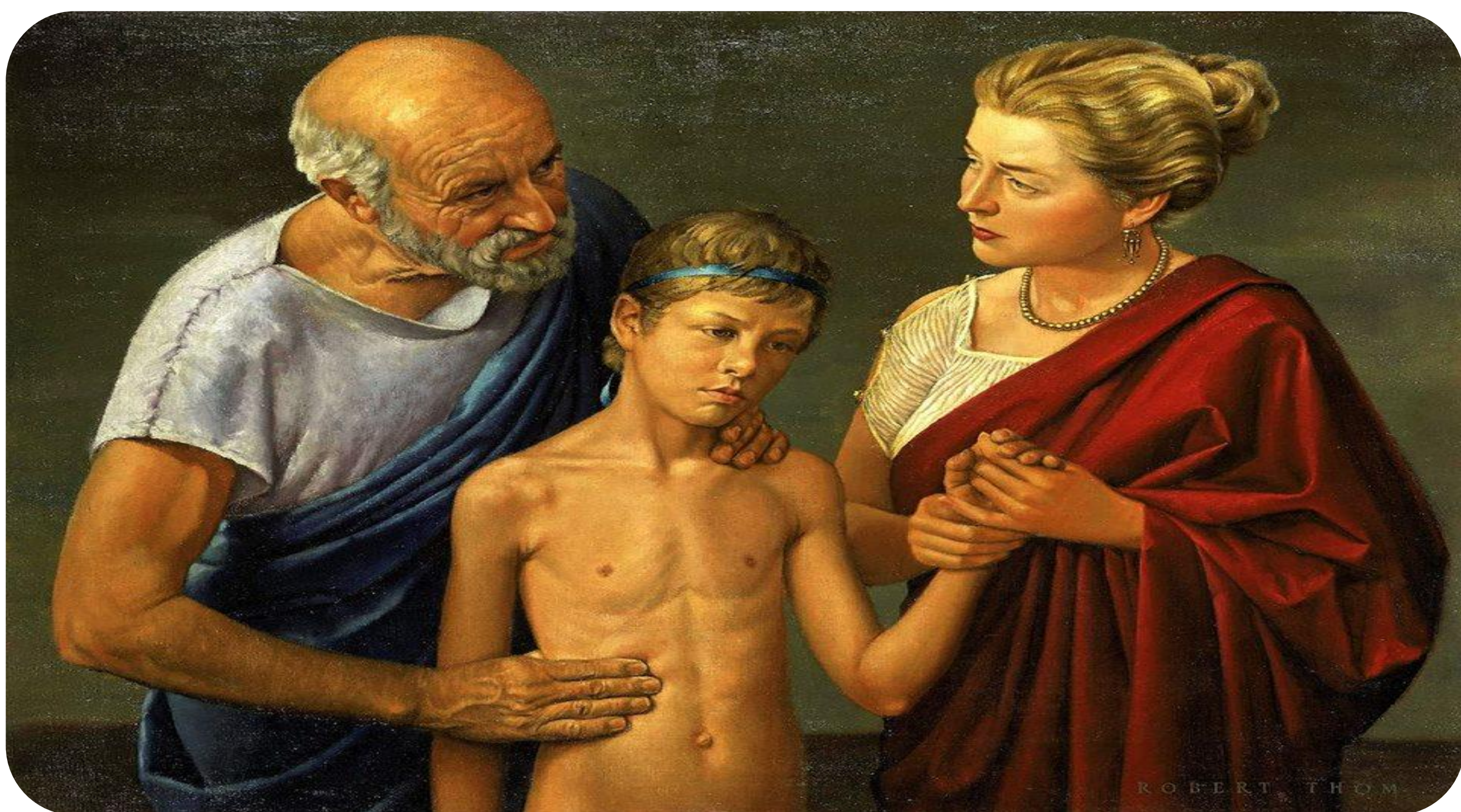


اثبات اینکه میکروب‌ها از سلول‌های والدین تولید می‌شوند و نتیجه تولید تصادفی نیست، از طریق آزمایش‌های دقیق در آزمایشگاه‌های موقت شیمی‌دان و زیست‌شناس معروف فرانسه، لویی پاستور (۱۸۲۲-۱۸۹۵) در دانشگاه اکول نرمال پاریس به دست آمد. پشت او، پرتله‌های پدر و مادرش را که در دوران جوانی خود نقاشی کرده بود، می‌بینیم. خانم پاستور صبورانه منتظر اوست تا مشاهده‌ای را به پایان برساند. از این آزمایشگاه‌ها، ثابت شدن نظریه‌ی جرم بیماری که تمرکزش بر روی میکروب‌ها بود و باعث تغییر شیوه‌ی پزشکی شد، واکسن‌هایی برای بیماری‌های خطرناک از جمله آنتراکس و بیماری‌های قارچی، حل مسائل بیوشیمیایی صنعتی و بنیانگذاری مؤسسه‌ی پاستور به دست آمد.



یک پزشک مصری در قرن هجدهم قبل از میلاد (حدود ۱۴۰۰-۱۵۰۰ قبل از میلاد) با لباس پارچه‌ای سفید و موی مصنوعی، همانند شایستگی و مقام خود، در برابر یک بیمار با علائم بیماری تنگی گلویی (که در یک پاپیروس باستانی به نام پاپیروس ادوین اسمیت شرح داده شده است) قرار دارد. با دستان مطمئن و همدردانه، پزشک بیمار را درمان می‌کند که با یک "صندلی خشتی" پشتیبانی می‌شود. دستورات درمان در پاپیروسی که توسط دستیار او نگاه داشته می‌شود، ظاهر شده است. کشیشانی که به طور ویژه آموزش دیده شده‌اند، آیین‌های مذهبی سحرخیزی را رعایت می‌کنند. پزشکی مصری برای ۲۵۰۰ سال در جهان باستان، موقعیت مهمی را به دست گرفت.

در سواحل خشک و آفتاب‌زده‌ی شبه جزیره پاراکاس در دهه اول قرن اول
لادی، یک جراح پروی با استفاده از چاقوهای ازیدیان شیشه‌ای بسیار سخت،
یک مخدر نباتی خام، پنبه و بانداز، عمل ترفینینگ را آغاز می‌کند. دستیاران
ار را ثابت نگاه می‌دارند و یک کشیش، با خواندن دعاها و نیایش‌های مذهبی،
به دنبال مداخله فوق‌طبیعی می‌گردد در حالی که عملی که بسیار کند و بسیار
رناک است، ادامه پیدا می‌کند. پرو، مرکز تمرینات فشرده ترفینینگ در دنیای
پید بود که این عمل (باز کردن جمجمه بیماران زنده) می‌تواند از سال‌های قبل
از طلوع عصر مسیحی تا قرن بیستم ردیابی شود.



هنر پزشکی در جهان باستان، در طول هزاره‌ی میانی میان سال‌های ۵۰۰ قبل از میلاد تا ۵۰۰ میلادی، در یونان به اوج خود رسید. این دوره خلاقانه، با نماد هیپوکراتس، "پدر پزشکی"، که نام او به معنای زیبایی، ارزش و شایستگی پزشکی در تمام دوران‌ها شده است، نشان داده می‌شود. محبت و توجه هیپوکراتس در اصل از طریق ضرب المثل او، "جایی که عشق به بشریت وجود دارد، عشق به هنر درمان هم وجود دارد"، به تجلیل رسیده است. این خصوصیات در چهره‌ی این بزرگترین پزشک، دانشمند و معلم، که در پایان قرن پنجم قبل از میلاد یک بیمار جوان را با دقت معاینه و سعی در آرام کردن یک مادر نگران درمان می‌کند، بازتاب پیدا می‌کنند. نام هیپوکراتس هنوز هم در محافل پزشکی، احترام بسیاری دارد.



آندره‌اس وسالیوس از بروکسل، اولین بزرگترین معلم آناتومی از مشاهدات طبیعی بود که در دوره‌ی استادی جراحی و آناتومی در دانشگاه پادوا (۱۵۴۳-۱۵۳۷)، بسیاری از دستورالعمل‌های آناتومیکی را بر روی بدن انسان اجرا کرد. این دستورالعمل‌ها با حضور دانشجویان پزشکی، پزشکان، مسئولان شهری، مجسمه‌سازان و هنرمندان، بسیار موفق بودند. وسالیوس، نخستین شخصی بود که با کتاب‌های آناتومیکی ۱۴۰۰ ساله‌ی گالن شکست خورد و در سال ۱۵۳۸ "تابولای آناتومیکه شش" و در سال ۱۵۴۳، "د آناتومی هومانی کورپوریس فابریکا" را منتشر کرد. اگرچه توسط گالنیست‌ها مورد انتقاد و استهزا قرار گرفت، اعتبار اثرات وسالیوس به زودی مخالفان را شکست داد و آنها به عنوان کلاسیک در ادبیات پزشکی شناخته شدند.