

# The cellular toxicity of *Panax ginseng* plant extract against certain pathogenic fungi and human lymphocytes

## Abstract

Clinical samples were collected for the purpose of isolating and diagnosing fungi. Direct microscopic examination results showed the presence of (67) is positive sample. the negative samples were (43) at rate (39.01%). screening laboratory of positive samples showed (72) sample rate (65.55 %). growth was not given (38) sample a rate (34.45%). Samples included swabs of patients with oral thrush and oral swabs for patients with respiratory and immune visually and vaginal swabs in addition to all of the skin, hair, nail and ear. 16 fungal species and genus *Candida* were isolated and diagnosed more frequent reluctance by (58.3%) than genus *Aspergillus* (25%). come as genus *Trichophyton* and by 9 sample a rate (12.5%). The females ratio (55.6%) yet to males (44.4%), as well as the oral cavity that was the area most affected (30.6%) compared with the other areas of the body, as the highest percentage injury fungal disease at age group (15-24 years) and least of all age group (<45 years). The results of the present study showed for *Panax Ginseng* alcoholic extract has a high inhibition effect against fungus disease. it showed the effectiveness of inhibitory toward the *Candida*, *Aspergillus*, *Trichophyton*, *Microsporum* and *Penicillium* in four concentrations (140 160 180 200) mg / ml. and these extracts have variable effects on fungi. the fungi have noted that the minimum inhibitory concentration between them (80-90) mg / ml. It was a positive relationship between the anymore the extract concentration increased its inhibitory effect. As related to the impact of plant extract Ginseng on lymphocytes, it showed the apparent influence in the increase in the number of lymphocytes increased significantly compared with the totals for control, as observed increase in the number of lymphocytes whenever a relationship is a positive and clear focus has increased, which is reinforced by the increase in stimulus immune when the incidence of fungal or microbial

Keywords: cytotoxic effects, *Panax ginseng*, pathogenic fungi, human lymphocytes

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## Introduction

The candidiasis of the greatest opportunistic diseases that may cause fungal infections and recurrence, as it contributes to both the use of antibiotics with a broad spectrum immunodeficiency virus class basis in the events and repeat injuries sick (1). *VtadC.albicans* opportunistic *Candida* of the most important in the first place, followed by the type *C.glabrata* which is the proportion receiving 16 percent of bloodstream infections, type *Add C.famata*, *C.krusei*, *C.tropicalis* and other other yeasts (2). Also found that most fungal infections by molds get sick and called the term Mycoses. As the president of the causes of these injuries are some of the molds being sick has a light boards are blowing out working on the events of pathogenicity (3). A fungus that causes it is *A .fumigatus*, *A .flavus*, *A.niger*. The fungus *A. fumigatus* trimmer in the most common occurrence of this injury for having the ability to invade the host tissue) 4). Also, leather rot arranged important events in the pathogenesis of the enzymes secreted by analyst class stratum including Keratinase enzyme which has the ability to solve the keratin content in the stratum corneum in mammals (5). Antibiotics used to treat such injuries including polyenes year as an example. Because of the negative role played by antibiotics through high toxicity that leave it (6). It has been resorting to alternative solutions including the use of medicinal plants as anti-fungal. As used medicinal plants for therapeutic purposes either extraction in whole or in part. (7) if it is a plant confounded normal for many of the compounds that have an important role in the inhibition of microbiology growth as some of them fighting properties of microorganisms in general such as oils Volatile oil and volatile alkaloids Alkaloid and tannins Tannendes and other (8), In light of the above study aimed to, isolate and diagnose some yeasts and molds disease-causing systemic infections and skin, Prepare alcoholic extract of ginseng

root *Panax ginseng* and effective disclosure of the vehicles, Study its impact on the molds using the agar dilution method and using the yeast spread through The agar -well diffusion method, and Study the effect of the extract on the side of the immune lymphocytes to humans outside vivo In vitro method using Mtt assay.

## Materials & methods

### Collection the Samples

sample were Collected included swabs of patients with oral thrush and oral swabs of patients with respiratory and immune visually and vaginal swabs in addition to all of the skin, hair, nail and ear. When were isolated the samples was carried out direct microscopic examination for samples by using potassium hydroxide 10% and then examined under the microscope under power (10X) and power (40X) to ensure presence of spores and Hyphae fungal. then Exposure thereafter to methods diagnosis for yeasts and molds , and yeasts were diagnosed microscopically by using Vaitek device whereas diagnosed the molds microscopically and Morphologically..

### Collecting of plant samples

the root part of the plant *Panax ginseng* Were collected from the local market as the city of Arbil, and then taken to the laboratory it was well cleaned and left to dry well. And then it was crushed by the mill laboratory to begin the process of extraction.

### Preparation of alcoholic extract and sterilize it

Preparation of alcoholic extract (80% ethanol conc.) the procedure for which included addition powder of root part (50 gm) in 500 ml of alcoholic solution ( conc. 80%) in a flask then stored at 4 c for (24 hrs). after that the solution was filtered by vacuum filtration & the resulted supernatant was concentrated by hot plate drying ,at( 60°C) till the concentrated solution became thick consistency and the final were in glass containers at ( 40°C) to use (9-10). Then the sanitize alcoholic extract through melting (1 g of alcoholic extract of the plant *Panax ginseng* in 5 ml DMSO (Dimethyl sulfoxide), and the sanitize of this extract using (Millipore Filter Paper 0.22) to prevent the passage of germs through it and this is concentration was considered a source for the preparation of subsequent concentrations used in the study , as used unit concentrations (mg / ml), a (140, 160, 180, 200) (11).

#### • General Reagents for Detection of phytochemicals in *Panax ginseng* .

##### 1- Alkaloids

**Dragendroffreagent** :Dissolve 60 mg  $\text{Bi}(\text{NO}_3)_3 \cdot \text{H}_2\text{O}$  in 0.2ml HCl and 600 mg KI in 1 ml water .combine both solution and added the acidic solution for the plant extract. An orange brown solution will appear.

##### 2- Flavonoids

**Sulfuric acid test**: flavones & flavonols dissolved in conc.sulfuric acid giving deep yellow solution. Chalcones give red color, flavanones give orange-red color.

##### 3- Glycosides

**Benedict's test** :Treat the test solution with few drops of Benedict's reagent (alkaline solution containing cupric citrate complex) and upon boiling on water bath, reddish brown precipitate forms if reducing sugars are present

##### 4- polyphenols

Ferric chloride(5%) in water or ethanol produces brown precipitate will appear in presence of polyphenols.

#### 5- **Steroids:**

1 ml of the extract is dissolved in 10 ml of chloroform and equal volume of concentrated sulphuric acid was added by sides of the test tube. The upper layer turns red and sulphuric acid layer showed yellow with green fluorescence. This indicated the presence of steroids.

#### 6- **Terpenoids:**

2 ml of extract was added to 2 ml of acetic anhydride and concentration of H<sub>2</sub>SO<sub>4</sub> . Formation of blue, green rings indicate the presence of terpenoids.

#### 7- **Tannins:**

**Ferric chloride test:** 1ml each of filtrate is diluted with distilled water and two drops of ferric chloride is added. A transient greenish to black color indicated the presence of Tannins.

#### 8- **Coumarins:**

3 ml of 10% NaOH is added to 2 ml of aqueous extract , formation of yellow colour indicates the presence of coumarins.

#### 9- **Saponins**

Because of their surface active properties, they may be recognized by shaking an aqueous solution of the sample will produce foam. 5 ml of extract was mixed with 20 ml of distilled water and then agitated in a graduated cylinder for 15 minutes. Formation of foam indicates the presence of saponins

#### **Inhibitory test the effectiveness of plant extracts on the molds**

The chosen fungal organisms were prepared to the test ,The ethanolic extract ( Panax ginseng ) were mixed with (PDA) at final concentration of (140, 160 , 180 & 200 mg/ml )then cultures with the The chosen fungal (two duplicate for each concentration ) and finally incubated at 25°C for 7 days . The diameter of growth (width & long) measured from the 3rd day of incubation to the 7th day . After that the inhibition zone for each culture plate were taken by the following equation.

$$\text{Inhibition rate} = \frac{\text{Diameter of control} - \text{Diameter of sample}}{\text{Diameter of control}} \times 100$$

#### **The effect of plant extracts in the growth of yeasts pathological**

followed the way The agar -well diffusion method for testing through vaccination center surface Zorai Sabouraud's Dextrose agar (SDA) mediated cotton sterile swab (Steril Swabs) of cultivated yeasts containing the (1.5X10<sup>8</sup>) cells / ml by comparing it with fixed solution turbidity and then left to dry dishes at room temperature, then worked then drill diameter (5 mm) in the middle grown-mediated piercing Cork Cork Borer. Then added (0.1 ml) Add all the concentrations of the alcoholic extract of each hole mediated absorbent minutes Micropipete and sequentially worked hole control of the addition of organic solvent DMSO (12) and incubated dishes temperature (37 m) for a period of 24 hours. Identified the effectiveness of each measure the concentration of CAS Qatar inhibition Inhibition Zone area around each hole(12). .

#### **Determination of the minimum inhibitory concentration (MIC) of the alcoholic extract of ginseng Panax ginseng**

followed the method used by the (13) I attended as a series of progressive Altakavljev plant extracts using liquid center Alsabroed ranged values (80-85-90-95-100-105-110) mg / ml. Then vaccinated by pipeline (0.1) mL of farm yeast or mold age (24) hours on the container (1.5X10<sup>6</sup>) cells / ml and then incubated tubes degree (30 m) for two (48) hours. The results were compared with Alsatrin (1) and (2)

aim to establish central Zirie impregnated fungal and Central Zirie with vegetable extract only respectively. Returned experiment in the case of non-appearance Ekorh in control (1) or when they appear in the control (2) .hddt damper minimum concentration value (MIC) as the lowest concentration of the extract, which prevents Ekorh clear to the naked eye in the center Zorai Then transfer (0.1) ml of all tubes where Ekorh did not appear to dishes container at the center of Alsabroed.houdnt dishes for two (24) hours at a temperature of (37 m) and set the value of the (MIC) as the lowest concentration of the extract reduces the number of colonies by 99.9% of the transplanted the original .

## **Effects of Panax ginseng on human Lymphocytes**

### **Collection of Blood**

Peripheral venous blood was used in all experiments. The source of the blood was a healthy 26 year old male donor. Ten ml of blood was collected in 50 ml sterile tubes with anticoagulant heparin. This blood was used for the isolation of lymphocytes.

### **The isolation of lymphocytes**

Ten ml of blood was added to 50 ml sterile test tube contains 500µl heparin as anticoagulant (14)..The blood was diluted by added 10 ml of PBS solution .Carefully 20 ml of diluted blood was added into a test tube containing 20ml of ficoll separation fluid (lymphprep; specific gravity=1.077g/l).The test tubes were centrifuged at 400 xg for 30 minutes at 4 ° C.After centrifugation, four distinct layers were obtained

The isolation of lymphocytes cells from normal human blood using density gradient centrifugation. The upper plasma layer was aspirated and discarded. The lymphocytes layer was carefully removed using a 3ml sterile Pasteur pipette and transferred to a sterile test tube.These cells were washed by adding 2ml RBCs lysis buffer and centrifuged at 400 xg for 10 minutes at 4 ° C to remove RBCs if present and other debris. After centrifugation, the pellets lymphocyte was washed by added 1 ml RPMI-1640 and centrifuged at 400 xg for 10 minutes at 4 ° C, the washing step was repeated three times. All supernatant were discarded. Finally, the isolated lymphocyte cells were collected again and suspended in RPMI- 1640 medium supplemented with 10% fetal calf serum, containing 100 units/ml penicillin, and 100µg/ml streptomycin, then transferred into microtiter plate and incubated for 24 hours at 37°C, in 5% CO2 incubator.

### **Cultured Human Lymphocytes**

The suspension of cultured human lymphocytes was adjusted to give a cell number of  $1 \times 10^4$  cells/ml.(100 µl ) of the cell suspension were dispensed into each of the 96 wells of the microtiter plate to give a final cell count of 1000 cells/well. Then plates were incubated at 37°C in an incubator supplemented with (5%) CO2 atmosphere incubated for 24 hours.

After incubation, a 100 µl of the each concentration (120 , 140 , 160 , 180 , 200 ) mg/ml serial dilutions of both Panax ginseng extract standard were transferred to individual wells of the microtiter plate using a micropipette. Negative control (lymphocytes only without any treatment) . Then lymphocytes exposure to Panax ginseng extract for 24 hours. Triplicate of each concentration were used. After incubation 50 µl of MTT dye (2mg/ml) was added to each treatment (50 µl/well) and then incubated for further 4 hours. The MTT-formazan crystals which formed only by live cells were dissolved with 100 µl DMSO added to all wells.

Optical density of each well was measured by using ELISA reader at a transmitting wavelength 620 nm (15,16). The inhibitory rate was measured according to follows:

$$\text{cell viability} = \frac{OD \text{ growth in the test}}{OD \text{ growth in the control}} \times 100$$

- **Statistical analysis**

Analyzed the results of the experiment by the statistical program (SPSS) in accordance with the CRD system design random  $2 \times 4 \times 7 \times 4 \times 2$  to extract less moral difference between LSD transactions at the level of probability of 0.01.

- **Results and discussion**

The positive sample for fungal infection 72 samples was diagnosed by microscopic examination and laboratory implant, as a percentage (65.45%) of the total 110 samples, while the samples that did not give the growth of fungal infection was (38) sample as a percentage (34.55%) as shown in Table (1) The negative results obtained by microscopic examination and laboratory implant may be caused by That some of the injured resort to the use of topical therapies ,randomly and without consulting a specialist doctor because of the inconvenience caused by the injury , This has led to affecting the vitality of fungi that cause injury and lack of growth after implantation (17). Through samples that give a positive growth show that the yeasts isolated proportion (58.3%) while the molds isolated proportion (41.7%) as in the table (2). This is in agreement with (18), where the results showed that the yeast comes first in order of disease isolates, may be the reason due to this being a normal flora found in the body. The study showed that the incidence in females is higher than males, where the percentage of females of the total examined positive samples (55.6%), while the male was (44.4%). Was also in the table (3). While the largest number of positive samples Obtained by the oral cavity with a percentage (30.6%), while for sputum samples did not show any growth for each of the molds and yeasts . as in the table (4). And that the presence of these pathogens as Normal flora in the oral cavity that quickly become a pathogen in the event of an immune deficiency. The oral injuries as reflected significantly in children and especially infants in the early stages of their lives as a result of acquiring these pathogens through their mothers by kissing and touching. Age group (16-25) are also more vulnerable to fungal infections, where the infection rate (33.3%) of the total examined positive samples. While there was a decrease of this percentage in the elderly significantly as the percentage (8.3%) at the age group (<45) as in the table (5) . This study was comparable with (19).That reason for the high rate of infection was due to the nature of the work, which occupied and for females, this age group are more stages susceptible to injury and re-infection as a result of obtain a higher sexual activity and pregnancy and lactation initial complications that occur during childbirth, which provides Living situation opportunism to cause pathogenicity and this is consistent with the results of (20)

### **Fungi isolated during the study**

After the diagnosis for each of yeasts by vitek and molds via phenotypic and microscopic diagnosis , Candida yeast came as higher Rate, more than Aspergillus molds with percentage (58.3%), (25%) for Each , respectively, while each of the genus Trichophyton, Microsporum and Penicillium recorded percentage (12.5%) (2.8%) and (1.4%), respectively, as in the table (6). This close to the results of (Mahmoud Abdi, 2006) in terms of increasing yeasts, including Candida more than Aspergillus molds and other molds. These results did not agree with (21) , because he reported that the percentage of Aspergillus genus is the highest of yeasts in the occurrence and recurrence of injury.

### **Chemical detection of active compounds in aqueous and alcoholic extracts of Panax ginseng**

The results of the detection of the active compounds in the alcoholic extract of the Panax ginseng plant, It's contain a number of compounds which : Alkaloids, Tannines, Saponines, Flavonoids,

Glycosides, Phenoles, Steroids, Terpenoids, Comarins. As in the table (7) detection results in the current study agree with the results of (22)

### **Testing of the Inhibitory effectiveness of the alcoholic extract of the roots of ginseng plant on pathogenic molds.**

Results of statistical analysis showed the presence of significant differences  $p \geq 0.05$  between the concentrations that used in affecting on isolated pathological molds, alcoholic extract has shown highly effective in inhibiting growth of molds. It was found that the extract gave the highest level of effect at the level of significant  $p \geq 0.05$  on *M. audouinii* for the four concentrations that used, when concentration was (200) mg / ml , the rate of colony diameter was (16) mm with percentage (76.95%). The *T. mentagrophytes* has appeared less effective as compared with other species where the rate of the colony diameter was 21 mm when the concentration was (200) mg / ml and the rate of inhibition was (72.70%) as in the table (8).

These results are comparable with the results of (23) when he stressed the high effectiveness by Ginsenosides content of the alcoholic extract of ginseng on some pathological molds with doubling concentrations, the concentrations of this study located within its range, he has been used concentrations (15.5 - 31.0 - 62.0 - 125.0 - 250.0 - 500.0) (mg / mL). Then he found a clear impact on all of *Aspergillus* sp. , *Trichophyton* sp , *Fusarium* sp , *Rhizopus* sp and *Alternaria* sp. Where growth rate diameters appeared approach to the results of this study

All of saponin and alkaloids perform an important role on the fungal cell membrane, where the mechanism of action of these compounds on fungal cells through direct effect on the cell membrane, causing the loss of membranes vital and membrane proteins Denaturation then fungal cell growth was stops And phenol that found in the composition of this plant play an important role through its effect on the balance of the cellular content through damaging for some proteins of membrane cell. As well as the alkaloids in addition to the same function done by saponins they work by make a difference with Osmotic pressure of the fungal cell. And play an important role in the interference of construction of cell proteins and adversely effect on the process of building DNA. (24).

Inhibitory effectiveness testing of the alcoholic extract of the ginseng plant on pathogenic yeasts.

Results of statistical analysis showed significant differences between the concentrations used for affecting on isolated pathological yeasts. Results showed that the Species *C. albicans* more sensitive to this extract while shown Species *C. krusei* more resistant to this extract effect from affecting species under effectiveness test. At the probability  $P > 0.001$ . While the remaining species under the effect of extract came by medium diameters of inhibition , as in the table (9)..

These results are compatible with the results (13) through ethanolic extract of the *Panax ginseng* plant effect on the yeast *Candida* including *C. albicans* and with double concentrations ranged between (15-500) mg / ml. Where showed clear results when treated with these concentrations Where the inhibition effect was increases whenever concentration increasing , . As the results came close in terms of the inhibitory effect of the study (21) . During the extraction of chitinase-like protein from Asian ginseng that has effective inhibitory effect against *Candida* yeasts and some pathological fungi. the Reason of extract inhibition for pathological yeast attributed to Ginsenosides content that contains phenol , saponins and alkaloids, which works directly on the structure of the fungal cell wall . The

mechanism of action of these materials appear mostly on the fungal cell membrane, Where it works to disabled of the membrane structure , causing leakage and the death of the membrane cells. Where all of alkaloid, phenols and saponins works essential role in the cell membrane. Where saponins works primarily on Ergosterol of cell membrane, which works to destroyed and the loss of vital membrane reasoned loss of vital fungal cell through disabled of the dynamic membrane Causing wide pores of the membrane and resulting deposition of contents of the cell, leading to damage. On the other hand Ginsenosides content works to analysis of fat layers in the cell membrane and the dispersion of electrical power in the membrane which cause the production of non-specific pores (13) As well as alkaloids in addition to the same work of the saponins it works on differences with Osmosis pressure of the fungal cell and it play an important role by interference of the construction of cell proteins to negatively effect on the process of DNA building. . (19)

Determine the minimum inhibitory concentrations of the alcoholic extract against pathological molds and yeasts.

Has been investigating about the MIC values of alcoholic extract of Ginseng Panax plant against pathogenic species, by preparing gradient dilution of the extract, And there appeared that there is a disparity in the recorded values against fungal and yeast species that MIC values of alcoholic extract against the species of pathological molds are (80-95) mg / ml, as in the table (10).

These results were comparable with the results of (23) and (25) in terms of the recorded values of C.albicans the cause of the high of minimum inhibitory concentration in some species over others, which confirmed by previous studies attributed to the high capacity of the fungal spores resistance against the extract. The reason of decrease in this values was due to efficiency of the extract for affecting these species.

The effect of the Panax ginseng plant extract on human lymphocytes

The statistical analysis results showed the treatment of lymphocytes with Panax ginseng plant extract appeared significant differences between used concentrations at probability  $P > 0.05$ .

Where was higher cell growth rate At the concentration (200) mg / ml was (0.674) with value of viability of the cells (723.609) while the lower growth rate of these cells At the concentration (120) mg / ml (.371). As shown in the table (11)

This study is compatible with many of the previous studies appeared the effect of ginseng extracts on lymphocytes in In Vivo and In Vitro with different concentrations, Where it agreed with the results of (26). While he observed a significant increase in defense cells, including NK-cell, phagocytosis and T-cell, compared with control groups who did not undergo to the test. It has been noticed then effectiveness of T- cell cells, including T-helper and T-suppressor as well as killer cells NK-cell was increase . This was confirmed by (27) through extract dosage for a number of volunteers and noted increase in the number of lymphocytes and decrease the frequency of infections in the gastrointestinal tract and upper respiratory, significantly.

**Table (1), the numbers and percentages of the laboratory and microscopic examinations of samples**

NO	Direct microscopic examination			Laboratory examination		
	Indicator	The number of samples	percentage	Indicator	The number of samples	percentage
1	The positive sample	67	%60.90	The positive sample	72	%65.45
2	The negative sample	43	%39.10	The negative sample	38	%34.55
3	Total	110	100	Total	110	100

**Table (2) Identification of pathogen**

NO	The pathogen	The number of samples	Percentage
1	Yeasts	42	58.3
2	Molds	30	41.7
3	The total number of samples	72	100

**Table (3) Distribution of pathological infections According to a source of bacterial isolates**

No	The source	The total number	percentage	The positive sample	Percentage
1	The mouth	30	27.2	22	30.6
2	The skin	21	19.1	14	19.4
3	The external ear	15	13.7	9	12.5
4	The hair	14	12.7	10	13.8
5	The vagina	13	11.8	10	13.7
6	The nails	10	9.2	7	9.8
7	The respiratory tract	7	6.3	0	0
8	Total	110	100	72	100

**Table (4) age groups**

No	age group	The total number	percentage	The positive sample	percentage
1	14-5	21	19.0	12	16.7

2	24-15	27	24.5	24	33.3
3	34-25	26	23.7	22	30.6
4	44-35	22	20	8	11.1
5	<45	14	12.8	6	8.3
6	Total	110	100	72	100

Table (5) Genera of isolated fungi

No	Fungal genus	Number of isolates	Percentage
1	<i>Candida</i>	42	58.3
2	<i>Aspergillus</i>	18	25
3	<i>Trichophyton</i>	9	12.5
4	<i>Microsporum</i>	2	2.8
5	<i>Penicillium</i>	1	1.4
6	Total	72	100

Table (6) detection of active ingredient in Ginseng *Panax ginseng*

No	Active compound	alcoholic	Aqueous
1	Alkaloids	++	+
2	Tannines	+	+
3	Saponines	+	+
4	Flavonoids	++	-
5	Glycosides	+	++
6	Phenoles	+	±
7	Steroids	+	+
8	Terpenoids	-	+
9	Comarins	+	+

(+) Indicates to positive detection (±)Indicates to a weak positive detection

(-) Indicates to a negative detection (++)Indicates to a strong positive

**Table (7) the effect of alcoholic extract of ginseng *Panax ginseng* in the growth of some pathological molds**

No	Fungus type	standard error $\pm$ Diameter rate of the colony growth Concentration (mg / mL) the measuring unit (mm)				Con +	P <
		200	180	160	140		
1	<i>mentagrophyate</i>	21 $\pm$ 2.26a	$\pm$ 2.76 32b	0.919 $\pm$ 35c	$\pm$ 1.77 44d	78 $\pm$ 0	0.001
2	<i>T.rubrum</i>	19 $\pm$ 2.40a	1.20 $\pm$ 22b	$\pm$ 6.72 30c	$\pm$ 2.33 41d	60 $\pm$ 0	0.001
3	<i>M. audouinii</i>	$\pm$ 1.344 16a	1.061 $\pm$ 21b	3.11 $\pm$ 33c	3.18 $\pm$ 43d	68 $\pm$ 0	0.0001
4	<i>A. fumigatus</i>	0.849 $\pm$ 20a	1.77 $\pm$ 28b	1.56 $\pm$ 30b	0.849 $\pm$ 35c	75 $\pm$ 0	0.001
5	<i>A.niger</i>	1.061 $\pm$ 18 a	1.061 $\pm$ 22b	1.061 $\pm$ 28c	4.17 $\pm$ 40d	67 $\pm$ 0	0.001
6	<i>A. flaves</i>	1.131 $\pm$ 17a	1.131 $\pm$ 21b	2.26 $\pm$ 29c	$\pm$ 3.39 44 d	62 $\pm$ 0	0.0001
7	<i>P.rubrum</i>	1.84 $\pm$ 18a	10.89 $\pm$ 25b	1.131 $\pm$ 28b	2.12 $\pm$ 38c	65 $\pm$ 0	0.026

**Table (8) the effect of different concentrations of the alcoholic extract of ginseng root *Panax ginseng* in the growth of some yeasts isolated during the study**

No	yeast type	standard error $\pm$ Diameter rate of the inhibition Concentration (mg / mL) the measuring unit (mm)				on +	P <
		200	180	160	140		
1	<i>C.glabrata</i>	$\pm$ 0.707	$\pm$ 0.707	$\pm$ 0.707	$\pm$ 0.707	0	0.001

		15.50a	11.50b	10.50b	6.50d		
2	<i>C. norvegensis</i>	±2.40 12.50 a	± 1.20 10.50b	± 6.72 7.50c	0.000± 1.00 d	0	0.00004
3	<i>C. krusei</i>	0.707± 10.50a	0.707± 8.50b	0.707± 6.50c	0.707± 1.50d	0	0.001
4	<i>C. guilliermondii</i>	0.707± 15.50a	0.00± 11.00b	0.707± 8.50c	0.000± 8.00c	0	0.00001
5	<i>C. kefyr</i>	0.00± 15.00a	0.707± 13.50b	0.707± 10.50 c	1.41± 10.0c	0	0.012
6	<i>C.albicans</i>	0.707± 16.50 a	1.41± 13.00b	± 0.707 11.50 c	0.707± 10.50 c	0	0.001
7	<i>C.famata</i>	0.707± 15.50a	0.707± 10.50b	0.707± 9.50b	1.41± 10.0b	0	0.009
8	<i>C.spherica</i>	0.707± 15.50a	0.707± 10.50b	0.707± 7.50c	0.000± 6.00d	0	0.0001
9	<i>C. parapsilosis</i>	0.707± 15.50a	0.707± 12.50b	0.00± 12.00b	0.707± 11.50 c	0	0.009

\* Similar letters in per class means the absence of statistical differences between the averages according to level of significance.

\* Con + represents control Meaning colonies diameters values without treatment with the extract

Table (9) values of (MIC) for alcoholic extract of Ginseng plant in the growth of fungi that studied with (mg / ml).

No	Types of molds	MIC values	Types of yeasts	MIC values
1	<i>T.mentagrophyate</i>	90	<i>C.glabrata</i>	90
2	<i>T.rubrum</i>	85	<i>C. norvegensis</i>	90

3	<i>M. audouinii</i>	80	<i>C. krusei</i>	95
4	<i>A. fumigatus</i>	80	<i>C. guilliermondii</i>	80
5	<i>A.niger</i>	85	<i>C. kefyr</i>	85
6	<i>A. flaves</i>	80	<i>C.albicans</i>	80
7	<i>P.rubrum</i>	85	<i>C.famata</i>	85
---	-----	-----	<i>C.spherica</i>	80
----	-----	-----	<i>C. parapsilosis</i>	80

**Table (10) the effect of different concentrations of ginseng root extract on human lymphocytes using the Mtt assay**

No	Concentrations (mg / mm)	Cell growth rate	The percentage of viability of cells
1	200	0.674 a	723.609
2	180	0.656 a	713.043
3	160	0.592 b	643.478
4	140	0.556 c	604.348
5	120	0.371 d	403.260
0.092	0.092	CON	6

P > 0.05 \*

## Conclusions

It was a positive relationship between the anymore the extract concentration increased its inhibitory effect. As related to the impact of plant extract Ginseng on lymphocytes, it showed the apparent influence in the increase in the number of lymphocytes increased significantly compared with the totals for control, as observed increase in the number of lymphocytes whenever a relationship is a positive and clear focus has increased, which is reinforced by the increase in stimulus immune when the incidence of fungal or microbial.

## Reference

1. **AL-Abeid , H.M. ; K.H. Abu-Elteen ; A.Z. Elkarmi& M.A. Hamad. (2004).** Isolation and Characterization of *Candida* spp. in Jordanian Cancer patients : prevalence , pathogenic determinants, and antifungal sensitivity . Jpn. J. Infect. Dis. , 57 : 279-284.
2. **Al-Joboory , A. and Al-Rawi,M. (1994) .** Natural pharmacology 1<sup>st</sup>ed .Dar Al-Huriah , Baghdad.
3. **Al-waaly , R.S.(2005) .** Incidence of otomycosis in otitis externa .Athesis submitted to the scientific Council of Otolaryngology.
4. **Ammar , H .K., Auroba , K. A ., Salma, I and Amer R A.(2010).**Isolation and Identification of Fungi Associated with Otomycosis.Iraqi J. Comm. Med .vol (3).p186-189.
5. **Arulmozhi, S.; Mazumeder, D.; Ashok, D. and Narayanan, L.(2007).** Pharmacological activities of *Alstonia Scholaris*. PharmacognocRev. , 1(1):305.
6. **Blumenthal M.(2003).** The ABC Clinical Guide to Herbs. New York, NY: Theime.211-225.
7. **Boyum, A. (1968).** Separation of lymphocytes from blood and bone marrow. Scand. J. Clin. Lab. Invent. 21:97.
8. **Dabo, N.T. and Yusha, U.M.(2007).** Incidence of systemic mycoses in patients with suspected tuberculosis In Kano, Nigeria. I.J.A.S., 1(1) : 35-39.
9. **Saleh A. H., Marwa K. Effect of Rosmarinus Officinalis Aqueous Extract on Some Biochemical Barameters and Histological Characteristics of Aorta in Hyperlipidemia Male Rats. University of Thi-Qar Journal of Science 2020; 7(2):1-4.**
10. **Saleh A. H. Study the potential effect of Rheum palmatum root extract against the toxicity of A.fumigatus in adult male rabbits. Al-Mustansiriyah Journal of Science. 2018; 29(1):23..**
11. **Freshney, R. I. (2012).** Culture of Animal Cell. Sixth Edition.Wily-Liss. New York.
12. **Jassim,A.N. ; Majeed,H.A and Habib,K.A. (2010).** Effect of Some predisposing factors on Vulvovaginal Candidiasis. Baghdad journal for sciences , 7(3) :1087-1090.
13. **Jorgenson, K. J.; Gotzsche, P.C.; Johansen, H.K. (2006).**Voriconazole versus amphotericin B in cancer patients with neutropenia. Cochrane. Database. Syst. Rev, 7 : 1-3.
14. **Kaur, R.A.; Mittal,N. ; Kakar, M.; Aggaroval, A.K.; and Mathur,M.D . (2000).**Otomycosis :Aclinicomycologic study ear,Nose throat . Journal . ,79 : 606-609.
15. **Lam.S.K., and Ng. T.B.(2000).**Isolation of a small chitinase-like antifungal protein from Panaxnotoginseng (sanchi ginseng) roots.Elsevier Science Ltd.
16. **Mahony, D. E.; Gilliatt, E.; Dawson, S.; Stockdale, E. and Lee, H. S. (1989).** Vero cell assay for rapid detection of *Clostridium perfringins* enterotoxin. Appl. Environ. Microbiol. J. 55:2141-2143.
17. **Masavki , M .S. and Katsuya,G.M.(2010).**Aspergillus Molecular biology and jenomics. Dept.Biotechnology.Graduate school of Agriculturet science. Tohoku university ,sendai ,Japan.
18. **MillsEdward , Jean-Jacques Duguo, Dan Perri , GideonKoren (2006) .** Herbal Medicines in Pregnancy and Lactation .An Evidence-Based Approach ,London and NewYork.

19. **Moallaei,H.;Zaini,F.;Rezaie,S.;Nourbakhsh,F.&Larcher,G.(2009).**The Enzymatic Activity and Molecular Characterization of aSecretedSubtilisin-Like Protease in *Microsporumgypseum*and*Trichophytonvanbreuseghemii*. Iranian J Publ Health, 38: pp.25- 33.
20. **Radad, K.; Gille, G.;Liu L, Rausch W.D.( 2006).**Use of ginseng in medicine with emphasis on neurodegenerative disorders. J Pharmacol Sci.100:175-186.
21. **Rafael, F. and Vaclav, V. (2000).** Advanced Methods in Cellular Immunology, vol. 3.CRC-Press LLC.U.S.A.
22. **Satana, Dilek ,GoncaErkoseGenc and ZayreErturan,(2010),** "The antifungal susceptibilities of oral candida spp isolates from HIV-infacted patents ", African Journal of Microbiology Research , Vol.4(6),pp466-470.
23. **Shareef ,A.Y.(1998).**The Molecular effect of Some groth and Metabolisim of Some gram positive and gram negative bacteria .ph.D.Thesis ,coll.Sci,Univ.Mosul,Iraq(In Arabic).
24. **Sung H, Kang SM, Lee MS.(2005).**Korean red ginseng slows depletion of CD4 T cells in human immunodeficiency virus type 1-infected patients. ClinDiagn Lab Immunol. 12:497-501.
25. **Sung, W. S. and Lee, D. G. (2008).**In Vitro Candidacidal Action of Korean Red Ginseng Saponins against *Candida albicans* .Biol. Pharm. Bull.31(1) 139 - 142.
26. **Vazquez, J.A.( 2010).** Invasive fungal infections in the intensive care unit. SeminRespirCrit Care Med; 31: 7986.
27. **Xu , L.L.; Han, T.; Wu, J.Z.; Zhang, Q.Y.; Zhang, H.; Huang, B.K.; Rahman, K.; Qin, L.P.(2009).** Comparative research of chemical constituents, antifungal and antitumor properties of ether extracts of *Panaxginseng*and its endophytic fungus. Phytomedicine . 16, 609–616.