Antimicrobial And Antioxidant Activities of *Lactarius deliciosus*

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INTRODUCTION

- Mushrooms, which have a particular importance in the classification of living organisms and in the ecosystem, have been consumed as food in many parts of the world for centuries and are known as an important source of medically valuable biologically active components. Because of these properties, it is extracted and used in the treatment and prevention of many diseases.
- In addition, fungi; fat, calories and carbohydrates, such as substances that can be harmful to the body low, vitamins, minerals, proteins are preferred in terms of nutrition as they are rich in foods. *Lactarius deliciosus* is one of these preferred fungi.

General Information about the *Lactarius deliciosus* Mushroom Species

- *Lactarius deliciosus* is a fungus species that cannot be cultivated in our country but can grow in natural environment. *Lactarius* literally means 'milky' and 'delicious'. The popular *Lactarius deliciosus*, also known as 'Kanlıca' or ın 'Çıntar ' mushroom, grows extensively in the forests of the Black Sea region and in many regions of our country. They usually occur in and around the forest, in the countryside, in the old arable fields after the autumn rains.

- *Lactarius deliciosus* hat may contain concentric circles with different shades of orange, gray, slightly greenish. It has a brittle structure and it becomes sticky when it is moist. Available in orange color lamellas. Lamellas are apricot-colored in young mushrooms. The color darker and the color of carrot takes place in developed plants. When the *Lactarius deliciosus* fungus is damaged, an orange-colored milk flows from the cross-sectional surface and becomes greenish when it comes into contact with air.

ANTIMICROBIAL ACTIVITY

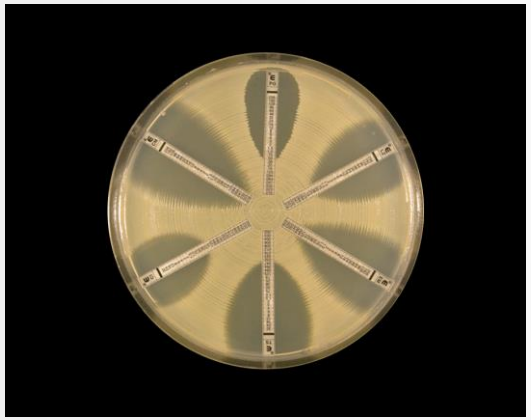
- Antimicrobial susceptibility tests are tests used to determine the in vitro efficiency of an antimicrobial agent against a particular type of bacteria.

- Today, the mechanisms of increased resistance of dangerous microbes to existing antibiotics are leading to intensive research of new antimicrobial agents. Plants and fungi in particular constitute an important source of natural antimicrobial agents.

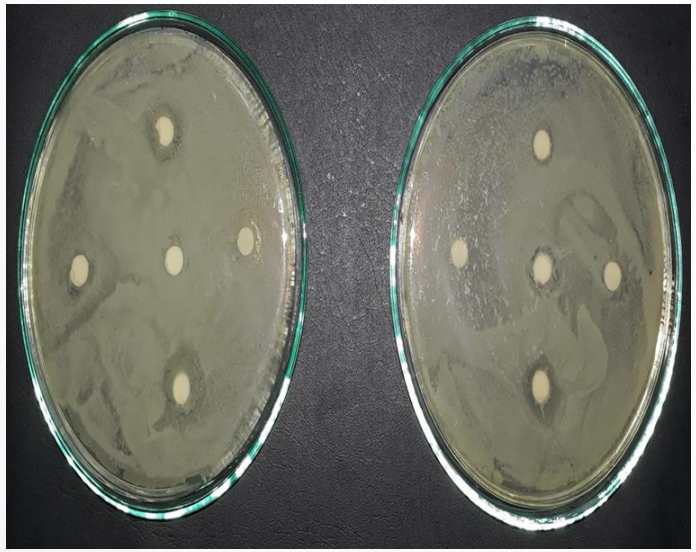
- It is not surprising by the nature of fungi that effective antimicrobial compounds that can be beneficial to human health are found in the data obtained as a result of scientific studies. Fungi need antibacterial and antifungal compounds to sustain their lives in a healthy way in their natural environment.

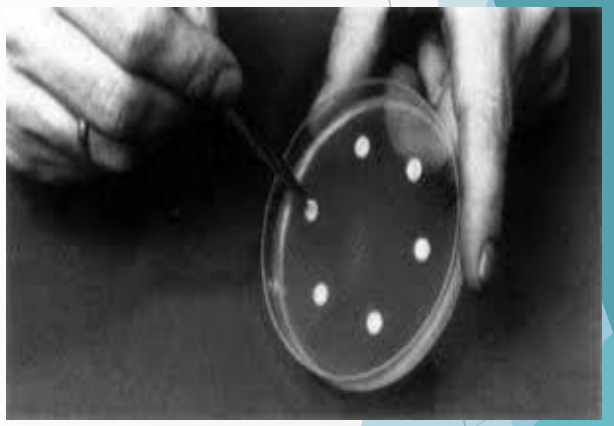
Methods Used in Determination of Antimicrobial Activity

- There are several antimicrobial susceptibility methods used to determine the in vitro antimicrobial activities of a substance. Some of these are given below.



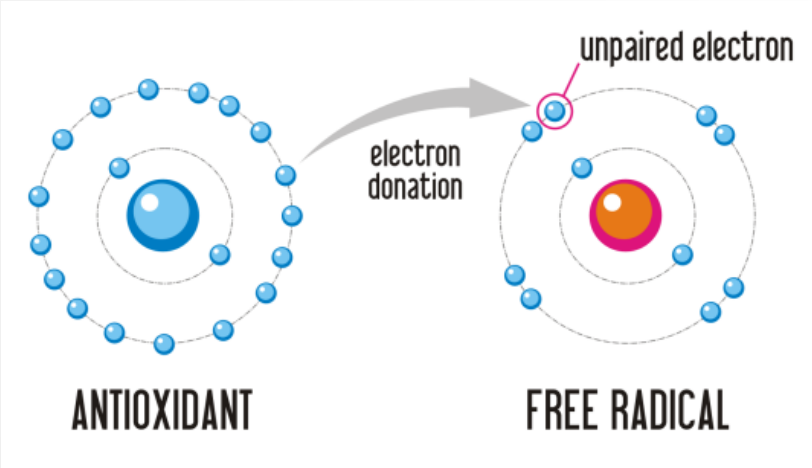
- Disc diffusion method
- Solid liquid dilution method
- E test





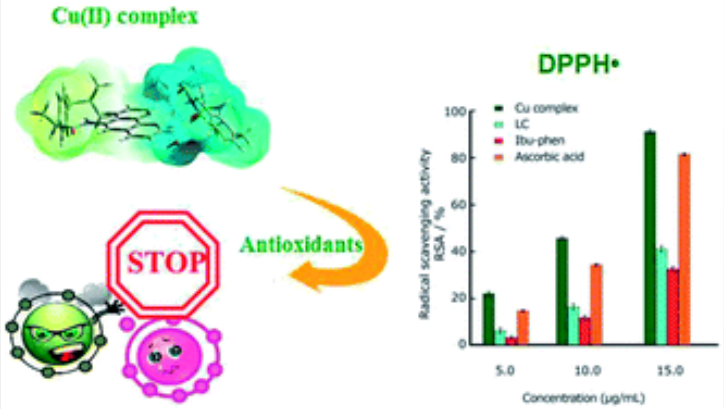
ANTIOXIDANT ACTIVITY

- Free radicals are highly effective chemical products that occur during metabolism in the body. The most important free radicals in biological systems are oxygen-based radicals, called Reactive Oxygen Species, ROS. Free radicals that form naturally in the body by metabolic means are normally eliminated by radical-breaking antioxidant systems. However, a number of pathological events called oxidative stress occur as a result of increasing reactive oxygen species and insufficient antioxidant mechanisms due to various reasons.
- Fungal extracts are used in many medical studies. In these studies, fungi were found to be antioxidant compounds such as phenolic, flavonoid, polysaccharide, glycoside, tocopherol, carotenoids and ascorbic acid.



- There are two basic methods used to determine the level in antioxidant studies. The first is the evaluation of antioxidant activity related to free radical species.
- The second category used in determining antioxidant activity is the use of important biological markers and important substrates in the evaluation of antioxidant activity. This is followed by examining the damage caused by free radicals on lipids, DNA and proteins.
- **Methods Used to Determine Antioxidant Activity**

1. **Hydrogen Atom Transfer Methods (HAT)**
2. **Electron Transfer Methods (ET)**
3. 2,2-Diphenyl-1-picrilhydrazil (DPPH) Free Radicalin Sweep Activity
4. **Other Methods**



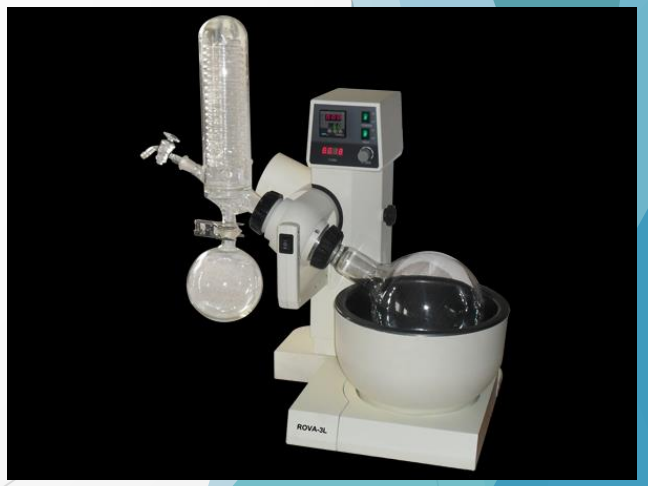
OBJECTIVES

- *Lactarius deliciosus* mushroom is also known as Kanlıca mushroom and is an edible mushroom with high nutritional value. The aim of this study was to determine the antioxidant and antimicrobial activities of water, ethanol and cloform extracts of *Lactarius deliciosus*.

MATERIALS and METHODS

- *Lactarius deliciosus* was collected from the province of Bolu under suitable seasonal conditions. Then the extract was obtained through soxlet and evaporator by drying the etuv.

- The antioxidant activities of the extracts were determined by DPPH (2,2-diphenyl-1-picrylhydrazase) method. Antimicrobial activities against *Escherichia coli, Candida albicans, Staphylococcus aureus, Enterococcus faecalis, Pseudomonas aeruginosa* were determined by disk diffusion method.



RESULTS

- The water and ethanol extracts of *Lactarius deliciosus* were found to have antioxidant activity. And also antimicrobial activity was determined according to the solvent used and the type of microorganism. The most susceptible strain was *P. aeruginosa* and the most resistant strain was *E.coli.*

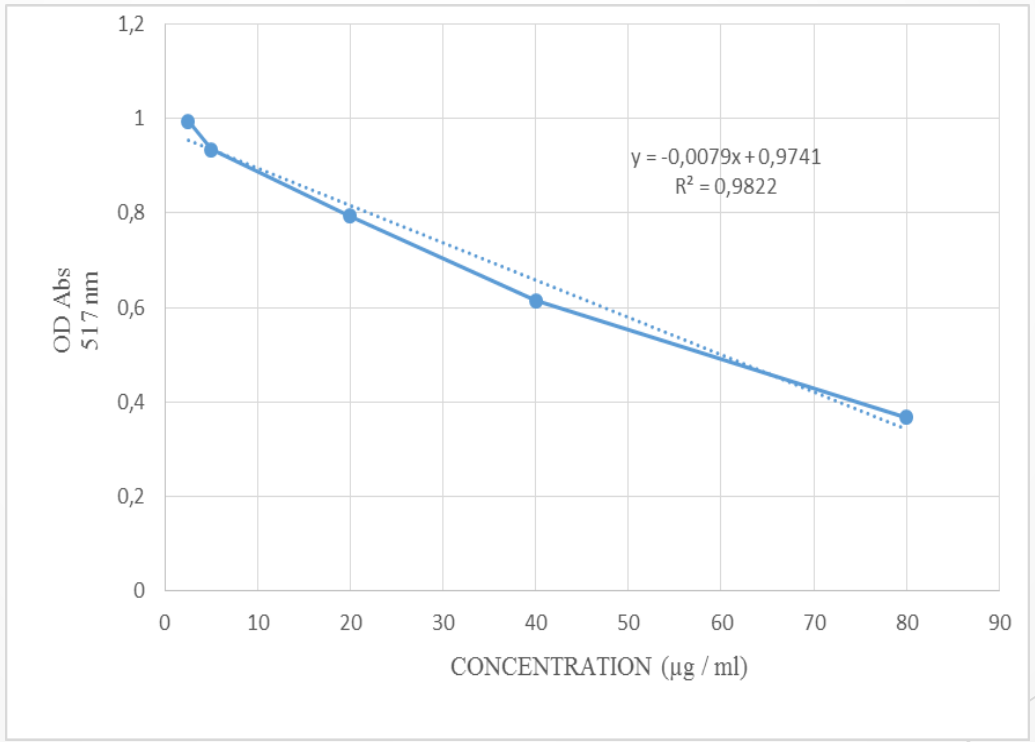
- Within the scope of this study, the antimicrobial and antioxidant activities of *Lactarius deliciosus* were investigated and the effective ones were determined and it is thought that the active ingredients to be obtained from these species may create the new resources needed.

	CONTROL						CONTROL+Extrakted					
	Chloroform		Ehtanol		Water		Chloroform		Ethanol		Water	
	5 µl	10 µl	5 µl	10 µl	5 µl	10 µl	5 µl	10 µl	5 µl	10 µl	5 µl	10 µl
E. coli	-	-	-	10	-	-	-	-	-	10,34±1,07	-	-
C. albicans	7,25	9,25	6,25	9,75	-	-	7,12±0,34	9,12±0,40	7,12±0,30	9,87±0,60	-	-
S. aureus	7,5	11	7,25	8,75	-	-	6,81±0,50	8,56±0,53	7,94±0,53	10,43±0,37	-	-
E. faecalis	-	-	-	9,25	-	-	-	-	-	10,41±0,62	-	-
P. aeruginosa	6,75	8,75	-	8,75	-	-	6,81±0,18	8,38±0,55	-	9,69±0,80	-	-

ND(: Not determined Values are mean of triplicate readings (mean ± S.D).

Samples	DPPH IC_{50}
Lactarius deliciosus(Ethanol Extract)	50.40
Lactarius deliciosus(Water Extract)	58.57
Ascorbic acid	34.60

Values was represented as mean ± standard deviations for triplicate experiments. DPPH IC50 was measured as µg/ml



- Thank you for listening to me.