

Investigation the antifungal activity of ethanolic extract of green tea leaves

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Green tea extract has been shown to possess various health benefits due to its rich content of antioxidants and other bioactive compounds. One of the lesser-known benefits of green tea extract is its antifungal activity, which has been demonstrated in several studies. Fungal infections are a common health concern, with some species of fungi causing skin infections, respiratory tract infections, and even life-threatening systemic infections in immunocompromised individuals.

Green tea leaves contains several polyphenols, including catechins such as epigallocatechin gallate (EGCG), which have been shown to possess antifungal activity. Studies have demonstrated that EGCG inhibits the growth of various fungal species, including *Candida albicans*, *Aspergillus fumigatus*, and *Trichophyton mentagrophytes*.

The aim of the study was determined the antifungal activity of green tea leaves ethanolic liquid extract.

Green tea leaves of spices Chun My were taken for the study, the raw material was collected in Anhui province (China) from March to May. 10.0 g of the grinded leaves was mixed with 200 mL of 96% ethanol. Extraction was carried out within 1 hour on water bath with a condenser, then repeated two times with a new portion of the solvent. After that the obtained extracts were filtrated and concentrated using rotary evaporator to 20 mL.

The antifungal activity was determined by the method of wells. Preparation of microorganisms` suspensions with determined concentrations of microorganisms (optical density) was carried out by the standard of turbidity (0.5 units according to scale of McFarland) with using of equipment of Densi-La-Meter (Czech, wavelength

540 nm). Colony forming unit was 10^7 microorganisms at 1 mL of growth medium and determined by standard of McFarland). On solidified agar, using a pipette under sterile conditions in Petri dishes made 1 mL of a suspension of microorganisms. After uniform distribution of microorganisms over the entire surface of the agar, the plates were incubated at room temperature for 15-20 minutes.

Next, wells with a diameter of 6 mm were made in the cups, into which solutions of the test substances were introduced. The samples incubated at 37° C for 16-24 hours.

After incubation, the plates were placed upside down on a dark matte surface so that light fell on them at an angle of 45° (accounting in reflected light). The diameter of the growth retardation zones measured using a caliper.

In the study following museum strains was used *Staphylococcus aureus* 6538 ATCC, *Bacillus subtilis* ATCC 6633. Chlorophyllipt spray manufactured by the State Scientific Center of Drugs (DNCLZ) with concentration 1% in 96% ethanol was used as the reference drug. The analyzed solution was 1% prepared solution of obtained ethanolic extract.

Table 1. Antifungal activity of green tea leaves extract and reference drug

Sample	Diameter of the growth retardation zone, mm
	<i>Candida albicans</i> ATCC653/885
Ethanolic extract	20.00 ± 0.50
Chlorophyllipt	19.00 ± 0.50

According to the conducted research, it was found that ethanolic extract inhibited the growth of fungi strains such as *Candida albicans* (20.00±0.50 mm). Comparing results of investigated extract and reference drug – «Chlorophyllipt» (DNCLZ) it can be pointed out that reference drug inferior of antifungal activity.

The present work showed that the ethanolic extract of green tea leaves possess remarkable antifungal activity against *Candida albicans* strains.