

STUDY THE TOTAL CONTENT OF PHENOLIC COMPOUNDS IN THE ETHANOLIC EXTRACT OF GREEN TEA LEAVES

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Introduction. Phenolic compounds are a group of naturally occurring compounds found in various foods and beverages, including fruits, vegetables, and tea. Green tea leaves contain a variety of polyphenols, including flavonoids, catechins, and phenolic acids. These compounds are potent antioxidants that can help protect cells from oxidative damage caused by free radicals such as epigallocatechin-3-O-gallate (EGCG). The EGCG is believed to be responsible for many of the health benefits associated with green tea consumption as supporting cardiovascular, nervous and immune function systems.

The aim of the study. Determine the total content of phenolic compounds in the ethanolic extract of green tea leaves.

Methods of research. The ethanolic extract of green tea leaves was obtained by the following way: 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 total amount of phenolic compounds was determined by Folin-Ciocalteu method. 1.0 mL of green tea leaves extract was dissolved in a 25.0 mL measuring flask and the volume was made up to the mark with 96% ethanol. An aliquot of the prepared solution was mixed with 1.0 mL of 1 M Folin-Ciocalteu reagent, the mixture was diluted to the 25.0 mL with 20% Na₂CO₃ solution. The measurement of optical density of the solutions was carried out at 760 nm 30 minutes after preparation. The calibration curve was plotted using gallic acid, the calibration equation $y = 0.1055x + 0.1745$ ($r^2=0.9951$). The total content of phenolic compounds in green tea leaves extract was calculated by the equation and expressed with respect to gallic acid [1]:

$$X(\%) = \frac{C_x \cdot m \cdot K_{dil} \cdot 100}{V}$$

where, C_x – concentration of gallic acid according to the calibration curve; $C \times 10^{-6}$, g/mL; V_{al} – volume of an aliquot, mL; m – mass of the raw material, g; K_{dil} – coefficient of dilution.

Main results. The total content of phenolic compounds was $8.70 \pm 0.20\%$ in the green tea leaves ethanolic extract.

Conclusions. The green tea ethanolic extract has the perspectives in the developing new medicines, dietary supplements and cosmetologically products.

References

1. In vitro antioxidant and antibacterial activities of green tea leaves (*Camella sinensis* L.) liquid extracts / O. Y. Maslov et al. *Annals of Mechnikov's Institute*. 2022. Vol. 2. P. 64–67.