DETERMINATION OF MACRO AND MICROELEMENT CONTENT OF FIG (FICUS CARICA L.) LEAF USING INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY METHOD

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Abstract: *This article provides information on the composition of macro and micronutrients and their beneficial properties in the body using the inductively coupled plasma mass spectrometry method of fig (Ficus carica L.) leaves.*

Keywords: *Antioxidant, flavonoid, ICP-MS, macro and microelements*

Fig leaves, derived from the Ficus carica L. plant, have been recognized for their medicinal properties for centuries. These leaves contain a variety of antioxidants, including polyphenols, flavonoids, and tannins. These compounds help protect against oxidative stress and free radicals, which can cause damage to the body and increase the risk of chronic diseases such as diabetes, cardiovascular conditions, and neurodegenerative disorders. Some of the compounds found in fig leaves, such as rutin, possess specific properties that contribute to reducing inflammation and combating aging. These properties make fig leaves potentially beneficial for conditions like arthritis and skin aging.

Initial research indicates that certain compounds found in fig leaves, such as ficusin and furocoumarins, may help regulate blood sugar levels. They have the potential to enhance insulin sensitivity and improve glucose metabolism, making them beneficial for individuals with diabetes or those at risk of developing the condition. Additionally, fig leaves contain enzymes that aid in healthy digestion and maintain gastrointestinal function. They promote regular bowel movements and support optimal gut health.

Extracts derived from fig leaves have been traditionally used in herbal medicine for their potential therapeutic benefits. They possess antioxidant and anti-inflammatory properties, which help combat skin infections, promote wound healing, and provide a protective barrier against environmental damage. Some of the present compounds, such as phenolic compounds and potassium, may have a positive impact on cardiovascular health. They contribute to regulating blood pressure, supporting healthy blood vessels, and reducing the risk of heart diseases.

While fig leaves show potential health benefits, further research is required to fully understand their impact on human health. If you are considering using fig leaves for their potential advantages, it is advisable to consult with a healthcare professional or a nutrition specialist for personalized advice on maintaining overall well-being.

Experimental Section:

To investigate the elemental composition of fig leaves, samples were collected and dried. Dried samples were ground into a fine powder to ensure uniformity. Organic matter was dissolved, and inorganic elements were extracted using an acid mixture, typically nitric

acid and hydrogen peroxide. This process facilitated the removal of organic materials and the release of non-organic elements.

Inductively Coupled Plasma Mass Spectrometry (ICP-MS) was used to measure the concentrations of the target elements in the samples. The instrument was calibrated using standard solutions with known concentrations of the elements of interest. The system was optimized for sensitivity and accuracy.

The acid-dissolved fig leaf samples were introduced into the ICP-MS instrument. Within the instrument, they were aerosolized and introduced into the plasma. The plasma ionized the elements, and the resulting ions were separated based on their mass-to-charge ratio. The elemental composition was determined using the signals obtained and calibrated against the standard calibration curve.

The identified signals were compared to calibration curves constructed from standard solutions. This process enabled the determination of the concentrations of various chemical elements in fig leaves.

The analyzed samples were sent to a scientific testing institute for elemental analysis. The study revealed the presence of 18 different macro and micronutrients in the fig leaf, confirming its rich elemental composition. Of the macro elements, five (potassium, sodium, calcium, phosphorus, and magnesium) were identified. Twelve different micronutrients (aluminum, iron, zinc, manganese, copper, barium, strontium, titanium, nickel, molybdenum, zirconium, and gallium) and one toxic element (lead) were also detected.

When examining the micronutrient composition of fig leaves, aluminum was found to be the most abundant element, followed by iron and trace elements. The order of abundance was as follows: Al > Fe = Zn > Mn > Cu = Ba = Sr

REFERENCES:

1. Sherg‘oziyev Qilichbek Marufjon o‘g‘li. (2023). INDUKTIV BOG‘LANGAN PLAZMA MASS SPEKTROMETRIYASI USULI YORDAMIDA ANJIR (FICUS CARICA L.) BARGINING MAKRO VA MIKROELEMENT TARKIBINI ANIQLASH. Scientific Impulse, 1(9), 1726–1728. Retrieved from http://nauchniyimpuls.ru/index.php/ni/article/view/8474

2. Sherg‘oziyev Qilichbek Marufjon o‘g‘li. (2023). ANJIR (FICUS CARICA L.) BARGIDAN KUMARINLAR OLISH. Scientific Impulse, 1(9), 1723–1725. Retrieved from http://nauchniyimpuls.ru/index.php/ni/article/view/8470

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