

## ARTICLES

DETERMINATION OF SOME ORGANIC ACIDS  
IN “BARAGSHUN EN” PREPARATION

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**Abstract:** *The current study aims to measure the amount of some organic acids in Baragshun EN preparation made from natural mineral baragshun; and to determine their chemical structures by using modern advanced technologies. As a result of HPLC analysis, the amount of benzoic acid in Baragshun EN preparation was measured at 12.84%, as well as, linoleic acid, cathinone and malonic acid were identified in the supplement through GC/MS analysis.*

*It has been identified that these organic acids in Baragshun EN preparation help restore the central nervous system, stimulate the immune system, prevent various diseases, protect the body, regenerate, and detoxify, and are antibacterial. The study reveals that the traditions used in folk medicine are similar to the results of our analysis.*

**Keywords:** *benzoic acid; linoleic acid; cathinone; malonic acid (propanedioic acid); GC/MS; HPLC analysis;*

## INTRODUCTION

Mumio has been used by man since approximately 3000 years ago. It is believed that mumio is used for both oral and topical application in folk medicine and that it does not have any adverse effect on health. Mumio is a stone-like substance found at high altitude in Mongolia, which has varied medical application in Mongolia and other Asian countries. Ancient healers used mumio as a salve for bone fractures, joint dislocations, poliomyelitis, facial nerve paralysis, and as an internal medicine for gastro-intestinal ulcer, intoxication and tuberculosis.

Baragshun EN is a preparation, which is purified from natural mineral mumio. There is no side effect on human and animal health because the preparation is made from natural medicinal product.

Mumio has been widely used in traditional Mongolian medicine since ancient times. This pale brown to dark brown tar-like bituminous substance is called “Baragshun” in Mongolian, which means *Rock Nectar*. It is found as deposits in caves and rocky crevasses of high mountains in Mongolia and other parts of Central Asia [2,3]. This traditional drug is also

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known as Mumio or Mumijo. In Ayurvedic medicine, Mumio is termed as Shilajit. There are several other names for Mumio.

Mumio is claimed to possess great healing effects and protective influence on human body [1,2,3]. Mumio exhibits immune-stimulating and anti-allergic activity, it also has an ameliorating effect against ulcers of varying origin, and finally, healing bone fractures. These therapeutic applications make this traditional drug effective in curing the following disorders: sore throat, angina, stomach and digestive disorders, oral cancer sores, gastroduodenal ulcers, chronic fatigue, allergies, asthma, eczema, diabetes, hemorrhoids, immunodeficiency, gynecological diseases and osteoporosis. Furthermore, Mumio accelerates the healing of bone fractures and post-operative suture. Mumio has been also used in Mongolian traditional medicine for sustaining stamina while promoting longevity. It has been shown to be safe for regular use and by people of every age. Therefore, our study aimed to determine the contents of Baragshun EN preparation, such as some organic acids [2,3].

Since ancient times, humankind has extracted organic substances such as fat, oil, dye, wine, sugar and vinegar from animals and plants, and has used them in their daily life, in spite

## MATERIALS AND METHODS

The Baragshun EN preparation is made from the organic raw material mumio. The mumio was collected from Khovd aimag in extreme east of Mongolia in 2017. To start with, we purified the natural mineral compounds as mumio. Baragshun EN preparation was prepared according to a pharmacopeia paper by T. Enkh-Oyun [4]. Natural medicinal material is purified and prepared without any chemical reactions and modification, which results in a pure natural product without any filling, forming and preserving substances.

In recent years, humankind has been radically refusing from chemically-synthesized drugs

of that, the derivatives of those organic substances have also been used for healing diseases (medicinal plants), and making soap and alcohol (fermenting the sugar). The earliest recognized organic substances include acetic acid, ethanol and dyeing substances.[1,6]

According to researchers, mumio contains proteins, amino acids, phospholipids, humine, benzoic acid as well as a number of metallic elements. Ionized elements are essentially important for both animal and human bodies, and therefore, their deficiency is compensated via diet, water and plants, which can provide the necessary nutrients.[2,3]

Linoleic Acid is a polyunsaturated essential fatty acid found mostly in plant oils. It is used in the biosynthesis of prostaglandins and cell membranes. Malonic acid is a naturally occurring substance found in some fruits. In food and drug applications, malonic acid can be used to control acidity, either as an excipient in pharmaceutical formulation or natural preservative additive for foods.

Proceeding from this premise, it is crucial to determine the amount of some organic acids and study their chemical structures in Baragshun EN preparations made from natural mineral baragshun, which has a rich content of both organic and inorganic substances, by using hi-tech equipment.

and preparations, instead opting for natural medicinal drugs and preparations. In view of this, it is critically important to have a proper knowledge about such natural medicinal drugs and preparations.

“Baragshun-EN” preparation contains not only minerals, but also biologically-active substances, which are essential for living organism. For this reason, it supports not only mineral metabolism, but also the body’s overall metabolism and has a positive effect on the normal functioning of the body.

Sample preparation: Baragshun EN preparation was extracted with chloroform-methanol

(2:1, v/v), and was converted into methyl ester using 5% HCl in methanol at 100°C for 3 hours in a sealed tube. The Baragshun EN preparation was prepared from methyl ester by using the Andersson and Holman (11) procedure. About 10 mg of fatty acid methyl ester was dissolved in 1 ml of pyrrolidide and 0.1 ml of acetic acid, and heated at 100°C in a sealed tube for 30 min. The mixture cooled to room temperature was taken up in methylene

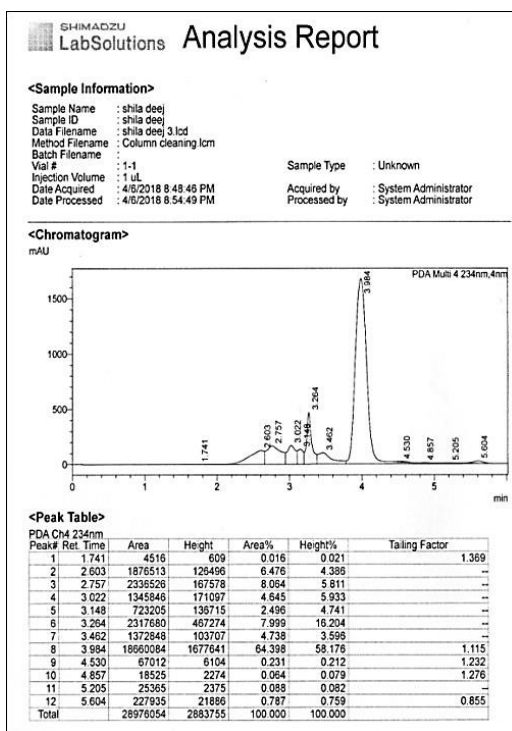
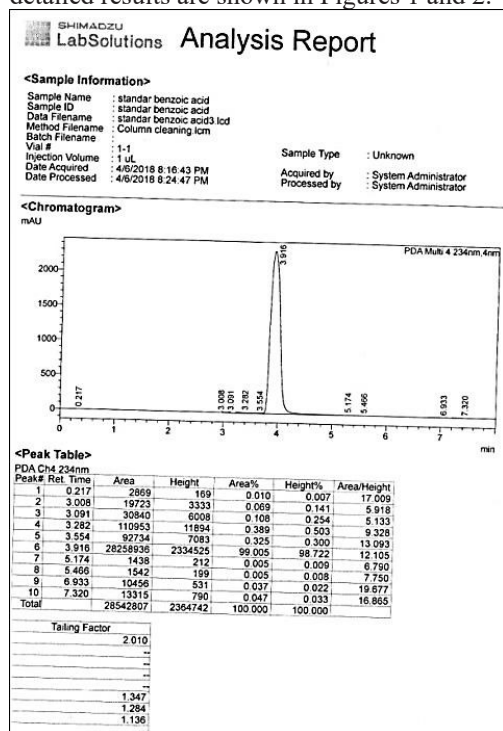
chloride and washed with dilute HCl and water. After drying it with magnesium sulfate and evaporation under a stream of nitrogen gas, the Baragshun EN preparation was dissolved in n-hexane to make a sample for GC-MS.

The amount of benzoic acid in Baragshun EN preparation was measured using HPLC analysis as described by Noodle Jankana Burana Osot et al., and some organic acids were determined using GC/MS analysis. [8,9,10]

**RESULTS**

**The result of measuring the amount of benzoic acid in Baragshun EN preparation using HPLC:**

Figure -1 and 2. The amount of benzoic acid in Baragshun EN preparation was 12.84%. The detailed results are shown in Figures 1 and 2.



**Result of determining some organic acids in Baragshun EN preparation:**

As a result of GC/MS analysis, organic acids such as Cathinone-C9H11NO, Propanedioic acid-C12H14N2O6 and Linoleic acid-

C20H36O2 were identified. The detailed results are shown in Figures 3, 4 and 5.

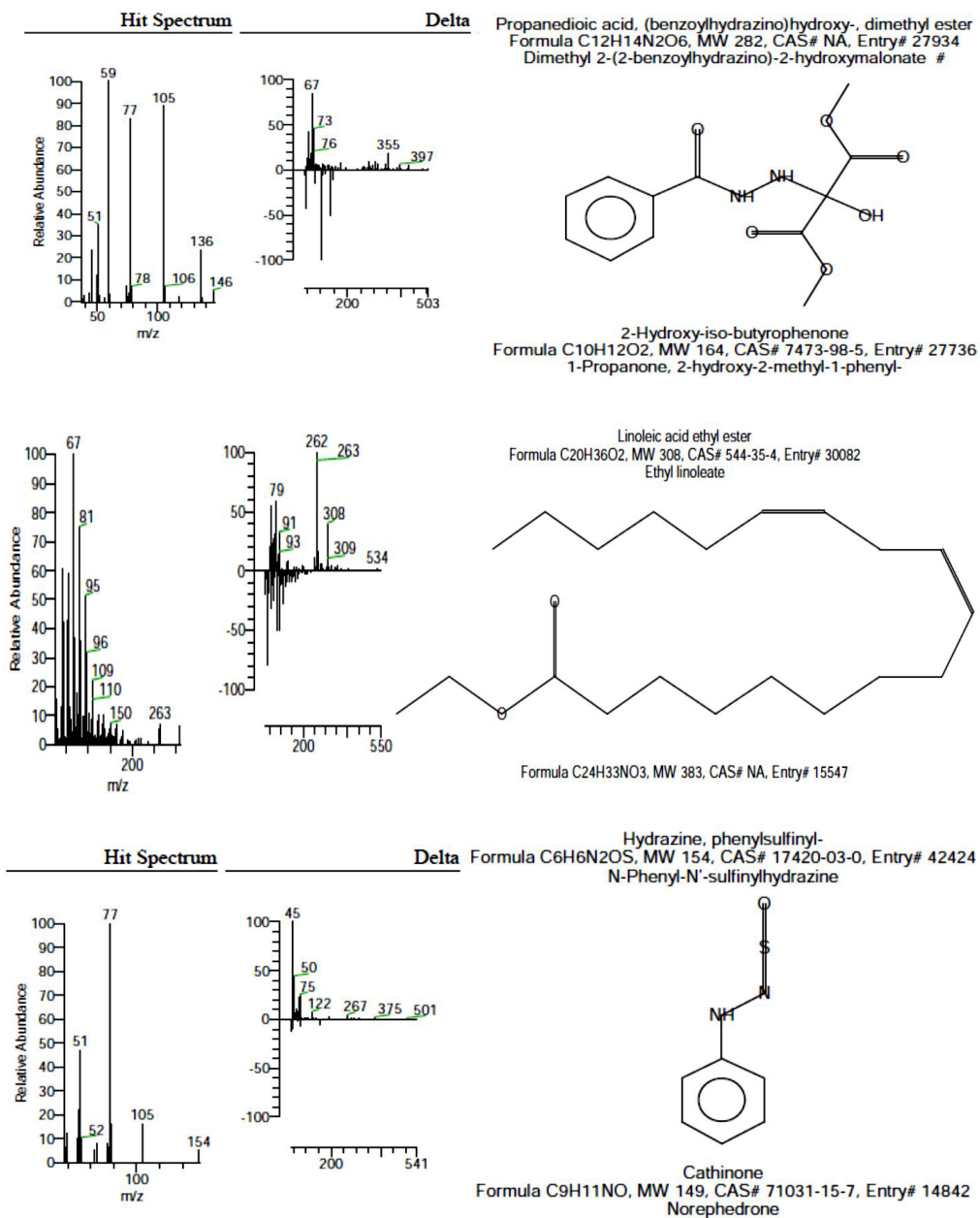


Figure-3, 4, 5. Result of GC/MS analysis in Baragshun EN preparation

## DISCUSSION

The beneficial effects of Baragshun EN preparation are thought to be due to the activity of its main active component, cathinone. Cathinone inhibited electric field stimulation-induced acetylcholine release and the contractions of smooth muscle, which could be responsible for the beneficial effects seen in airway disease. Internationally, cathinone is a Schedule I drug under the Convention on Psychotropic Substances. Cathinone has been found to stimulate the release of dopamine and inhibit the re-uptake of epinephrine, norepinephrine and serotonin in the central nervous system (CNS).

A very low dose of cathinone, a bio-active substance, has stimulating effect on the central nervous system for a brief spell of time. If used for a long period of time or if a high dose is administered [5], it has an adverse effect.

## CONCLUSION

1. The amount of benzoic acid in Baragshun EN preparation was measured as 12.84% by HPLC analysis.
2. Organic acids, such as Cathinone-C<sub>9</sub>H<sub>11</sub>NO, Propanedioic acid-C<sub>12</sub>H<sub>14</sub>N<sub>2</sub>O<sub>6</sub> and Linoleic acid-C<sub>20</sub>H<sub>36</sub>O<sub>2</sub>, were identified in Baragshun EN preparation by GC/MS analysis.

Benzoic acid decreases the risk of pathogenic bacterial growth. Furthermore, it is widely used for the treatment of urogenital tract diseases [8, 9].

When this substance is used regularly, free radicals in body are eliminated, thereby, the aging process slows down and organism is prevented against various diseases [7].

Malonic acid has the effect of protecting organism from pathogens, and it has a regenerating and detoxifying [2, 4] qualities. All in all, the reason why baragshun has been widely used in traditional medicine practice for curing various diseases might be clearly explained by its bio-active substances. Our research findings on determining the organic acids, using HPLC and GC/MS, support the above explanation.

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