



The Effect of Roasting Methods of Ingredients The Songgak Tribe Sasak Herbal on Active Compounds Using Gas Chromatography Mas Spectroscopy (Gc-Ms) Analysis

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Abstract

Songgak is a concoction of the Sasak tribe of Lombok in West Nusa Tenggara. It consists of coffee mixed with groundwood, cloves, black pepper, coriander, and nutmeg. The original recipe involves roasting the spices before mixing them with coffee, namely using a frying pan over a stove. The roasting process is carried out without controlling the temperature and roasting time, so the roasted ingredients need to be standardized. GCMS is a tool used to analyze compounds in samples using chemical separation methods, mainly chromatography. The compounds in the mixture are separated in a chromatographic column. The separation mechanism between several compounds occurs due to differences in the solubility values of each in the moving solvent and differences in the absorption of each of the competing compounds into the stationary phase (Gross, 2017). In this research, variations will be carried out on spices, namely T1 original treatment of roasting spices over fire for 8 minutes, T2 drying spices in sunlight, T3 oven for 5 minutes, T5 oven for 5 minutes, T4 oven for 15 minutes and T5 oven for 15 minutes. In the T4 treatment, namely oven for 10 minutes, the results of the analysis of the substance content with the most types, namely 20 types, were obtained. The active anti-microbial compound found in all treatments was Hexadecanoic acid, 2-hydroxy-1-(h)(C19 H38 O4) BM:330, which helps inhibit the growth of cancer cells. (National Library Medicine, n.d.). Octadecanoic acid (CAS) Stear (C18 H34 O2) BM:282 Anti-inflammatory, Antiandrogenic Cancer prevention, Hypocholesterolemia Dermatogenic, 5-Alpha reductase inhibitor, Anemiagenic, Insecticide (Natarajan et al., 2019) and Tetradecanoic acid (CAS) Myris (C14 H28 O2) BM:228 as anti-inflammatory and anti-nociceptive.

Keywords: Songgak; Active Compound Roasting; GCMS

INTRODUCTION

Minister of Health Regulation no. 003/MENKES/PER/I/2010 concerning the Sanctification of Herbal Medicine. Riskesdas increased by 44.3% from 2010 to 2018. The repertoire of traditional medicine recipes accompanied by abundant medicinal plant materials offers an opportunity for the pharmaceutical production of conventional medicines (Kemenkes RI, 2019). Songgak is a concoction from the Sasak tribe of Lombok in NTB that consists of crushed

wood, cloves, black pepper, coriander, and nutmeg. It is used by roasting it in a frying pan over a stove flame. The temperature and length of roasting are not controlled so that the herb is stopped roasting according to the taste of the processor, namely until it emits a certain distinctive aroma. (Dewi et al., 2021). Processing technology to obtain high-quality medicinal plant contents is crucial because sound processing produces healthy medicines. If the processing technology is incorrect, the active substance content will be damaged and toxic to

humans. One of the critical processing stages is drying herbal raw materials, a process for making *simplicia* (dried herbal ingredients, *simplicia* can be used for pharmaceutical needs and traditional herbal medicine. Drying is a method for removing or removing water from a material. Plant drying can be done naturally (under the sunlight, in the shade) or artificially, under the influence of a heat source. (Nesti & Sianipar, 2015).

The aims of this research are (T1) Measuring the active compound content test using GC – MS from the roasting treatment of the Songgak herbal concoction, the original treatment of roasting the spices over fire for 8 minutes. (T2) Measuring the active compound content test using GC – MS from the Songgak herb drying treatment, drying the spices under the sun for two days when the sun is hot from 10 to 4 in the afternoon every day. (T3) Measuring the active compound content test using GC – MS from the drying treatment of Songgak herbal concoction in the oven for 5 minutes. (T4) Measuring the active compound content test using GC – MS from the drying treatment of Songgak herbal concoction in the oven for 10 minutes. (T5) Measuring the active compound content test using GC – MS from drying the Songgak herbal concoction after the steaming treatment for 15 minutes.

METHOD

The main ingredient used in this research is Songgak herbal medicine, which has various types. Other materials are filter paper, distilled water, and aluminum foil. The equipment used in this research is spray bottles, separating funnels, standard clamp analytical scales, spatulas, sieves, grinders, ovens, desiccators, ultrasonics, rotary Chempublish, GC-MS QP 2010, as well as other glass tools commonly used in the laboratory.

Sample Preparation

The sample was extracted first using methanol and then analyzed using QP 2010 GC-MS, oven temperature (0°C-325°C), interface (250°C), and total flow (104 mL/minute. The sample was extracted first using methanol Control mode (split split ratio (100:1), pressure (10,523 psi), split flow (100 mL/min), HP-5MS column 30m x 250 µm x 0.25 µm, gas (He) and detector (MSD)

RESULT AND DISCUSSION

GCMS uses several variables and variations, namely raw materials that have not been oven or roasted, then dried using the oven method with several variations in drying time and then roasting. GCMS is a tool used to analyze compounds in samples. One of the most essential chemical separation methods is chromatography. The compounds in the mixture are separated in a chromatography column. The separation mechanism between several compounds occurs due to differences in solubility values.

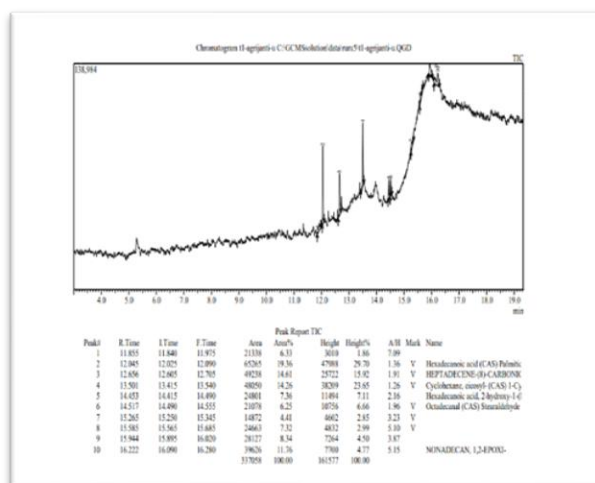
Results of Active Substance Testing using GCMS.

The GCMS T4 results have complete compounds, namely 19 compounds, each with its properties, namely: Phenol, 2-methoxy-3-(2-propenyl)—CA Formula (C₁₀H₁₂O); BM 164.2011 as an anti-microbial (Alenazy, 2023) TRANS(.BETA.)-CARYOPHYLLENE as antihistamin (Soares et al., 2013). 1,6-ANHYDRO-BETA-D-GLUCOPYR as anti-oxidant (Mahani et al., 2021). Phenol, 2-methoxy-4-(2-propenyl)-, acetat as anti-oxidant (Purwono & Wahyuningsih, 2012). 9-Eicosene, (E)- (CAS) C₂₀H₄₀ BM 252.4784 anti-mikrobia (Lulamba et al., 2021). Tetradecanoic acid (CAS) Myristic acid as anti-inflammatory (Alonso-Castro et al., 2022). The therapeutic uses of caffeine are used in the pharmaceutical field as an analgesic and to reduce fever. (Annisa et al., 2020). NAPHTHALENE,

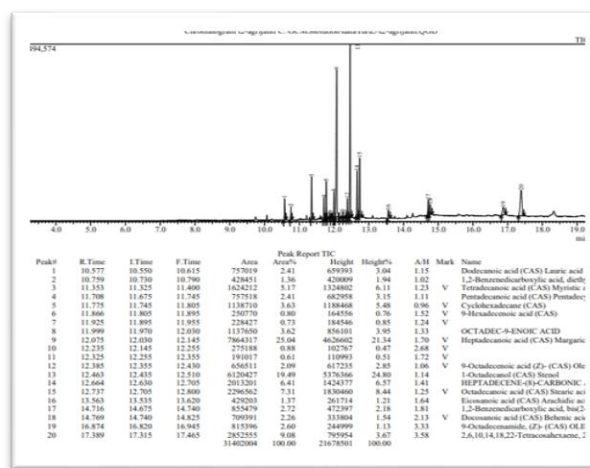
DECAHYDRO-1,1-DIM has potential such as anticancer, anti-inflammatory, antibacterial (Hotmian et al., 2021). Hexadecanoic acid (CAS) Palmitic acid inhibits the growth of fungi (Alenazy, 2023). 1-Octadecanol (CAS) Steno acts as an anti-inflammatory. 9,12-Octadecadienoic acid (Z,Z)- (CAS).

Inhibits the growth of cancer cell (Alenazy, 2023). Octadecanoic acid (CAS) Stearic acid Anti-inflammatory, Antiandrogenic Cancer prevention, Hypocholesterolemia Dermatogenic Anemiagenic, Insecticide, Flavoring (Natarajan et al., 2019). Cyclohexane, eicosyl- (CAS) 1-Cyclohe has antimicrobial properties. Eicosanoic acid (CAS) Arachidic acid functions as an enzyme and receptor and plays a role in cell death, baby development, and correcting neurological disorders ((PubChem, n.d.-a).1-Triacontanol Is a natural growth enzyme (Zhengzhou Delong Chemical CO., 2022). Hexadecanoic acid, 2-hydroxy-1- (hydroxymethyl)eth, helps inhibit the growth of cancer cells (National Library Medicine, n.d.) Piperidine, 1-[5-(1,3-benzodioxol-5-yl)-1 Acts as an antioxidant (Lahmidi et al., 2021).

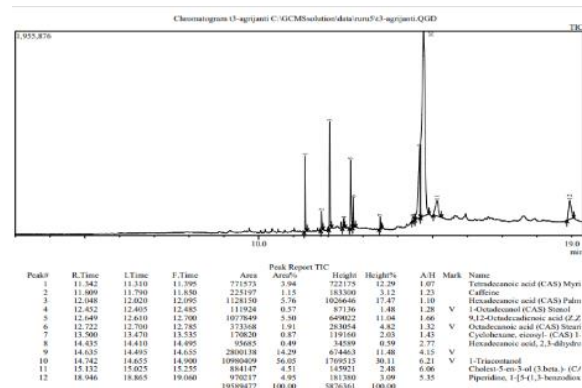
Chromatographic Analysis of the Active Substance Content of Songgak Treatment (T1)



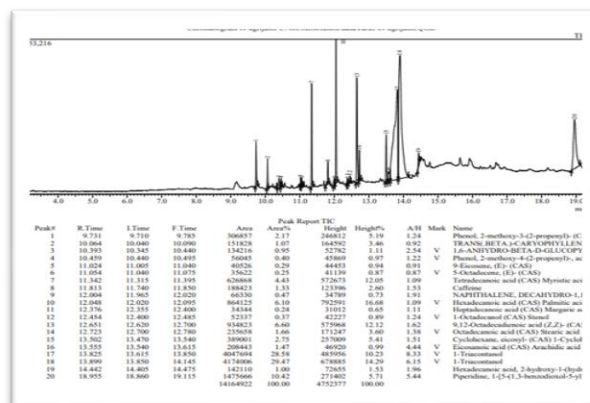
Chromatographic Analysis of the Active Substance Content of Songgak Treatment (T2)



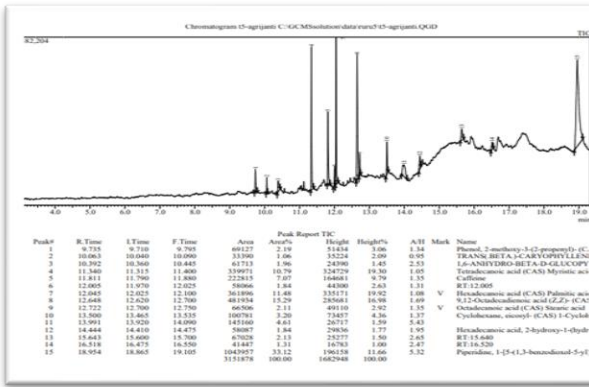
Chromatographic Analysis of the Active Substance Content of Songgak Treatment (T3)



Chromatographic Analysis of the Active Substance Content of Songgak Treatment (T4)



Chromatographic Analysis of the Active Substance Content of Songgak Treatment (T5)



The results of the active compound content test using GC – MS from the roasting treatment of the Songgak herbal concoction, the original treatment of roasting the spices over fire for 8 minutes, showed that the majority compound content was six compounds, drying the spices in the sun for two days when ten compounds were obtained, the drying of the Songgak herb concoction was oven treated. For 5 minutes, as many as ten compounds, drying treatment of Songgak herbal concoction, oven treatment for 10 minutes, as many as 19 compounds and drying treatment of Songgak herb concoction, oven treatment for 15 minutes, as many as 11 compounds.

CONCLUSION

Treatments, T1, T2, T3, T4, and T5 contain the highest types of compounds. The T4 treatment, namely Songgak, contains the mixture baked for 10 minutes. Namely, there are 20 compounds, followed by the kind of compound content in the T2 treatment, which uses drying only by drying. The sun contains 17 compounds. Gas Chromatography-Mass Spectrometry (GCMS) analysis shows that 20 main compounds have anti-microbial properties from bacteria and fungi. The compounds identified in GCMS are stable at high temperatures because the Songgak spice raw material goes through a heating process above 100oC. The active anti-microbial compound in all treatments is Hexadecanoic acid, 2-hydroxy-1-(h)(C19). H38 O4) BM:330 helps inhibit the growth of cancer cells (National Library

Medicine, n.d.), Octadecanoic acid (CAS) Stear (C18 H34 O2) BM:282 Anti-inflammatory, Antiandrogenic Cancer prevention, Dermatogenic Hypocholesterolemia, 5-Alpha reductase inhibitor, Anemiagenic, Insecticide (Natarajan et al., 2019) and Tetradecanoic acid (CAS) Myris (C14 H28 O2) BM:228 as anti-inflammatory and anti-nociceptive (Alonso-Castro et al., 2022).

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