



اَبُو سَيِّدِي تَيْكُو لُو كِي مَبَارَا
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TITLE:

DETERMINATION OF GALLIC ACID USING DIFFERENT EXTRACTION
SOLVENT ON *AZADIRACHTA INDICA*

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ABSTRACT

Azadirachta indica (neem) is a member of the Meliaceae family, and its effectiveness as a health-promoting plant is attributed to its bio-active compounds. It has traditionally been used in Chinese, Ayurvedic, and Unani medicine, particularly in the Indian Subcontinent, to cure and prevent a various human diseases. The bio-active compounds found in the plant have shown the efficacy of neem leaves in medical and consumer goods. These bio-active compounds can be obtained by using an optimum and appropriate extraction parameter. The extraction parameters include suitable drying methods, suitable solvents to extract polar or non-polar compounds, types of extraction technique and others. However, the comparative scientific study on the effect of using different extraction parameter towards the the extraction yield and amount of extracted bio-active compound has been very limited. Therefore, this research study was conducted in order to find a solvent capable of extracting the optimum extract yield and gallic acid. Acetone, ethyl acetate, and hexane were selected as extraction medium, and maceration technique was conducted to test which solvent yielded the most neem extract. The concentration of gallic acid in each extract was determine by using High Performance Liquid Chromatography (HPLC) test was observed after the extract is obtained. The highest yield obtained was ethyl acetate extract about 13.59%, followed by acetone and hexane extract 3.23% and 1.06% respectively. The crude oil of extraction is all greenish brown and smelly, with a high viscosity of solution. The highest concentration of gallic acid was found from hexane extract with the value of 46.08ppm. Therefore, maceration extraction is considered as an alternative process for obtaining the bio-active gallic acid compounds with high concentration from neem leaves by using hexane as a solvents.

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CHAPTER ONE

BACKGROUND

1.1 Introduction

Neem (*Azadirachta Indica*) is a type of tree that is native to the tropical regions of India and Africa. It is part of the Meliaceae family and is known for its fast growth and large, bushy trunk. The tree is evergreen, meaning that it has leaves all year round, and is commonly used for medicinal and cosmetic purposes due to its natural properties. Neem has been traditionally used in Indian Ayurvedic medicine for centuries and is known for its ability to treat a variety of health conditions and skin problems. The World Health Organization (WHO) estimates that 80% of the population in developing countries still relies on traditional medicine, including plant-based remedies, for their primary health care needs. Neem has been used for medicinal purposes for thousands of years, and its popularity as a natural remedy continues to this day. Neem has been shown to have antibacterial, antiviral, anti-fungal, and anti-inflammatory properties, making it a useful natural remedy for a variety of health conditions (Kumar et al., 2014).

In current research, neem and its active compounds, such as gedunin, have been extensively researched for their potential anti-cancer properties. Triple-negative breast cancer (TNBC) is a particularly aggressive form of breast cancer with limited treatment options, making it an important area of research. Studies have shown that gedunin isolated from neem seed oil has the potential to act as an inhibitor of heat shock protein 90 (Hsp90), which is involved in cancer cell growth and survival. This suggests that neem and its compounds may have a promising role in the treatment of TNBC and other forms of cancer (Jeelani et al., 2023).

Gallic acid is a naturally occurring organic acid found in various plants, including oak bark, tea leaves, and grapes. It is commonly used as an antioxidant and anti-inflammatory agent. In simpler terms, it is a type of chemical found in plants that is believed to have health benefits and is used in some food and cosmetic products.