# UNIVERSITI TEKNOLOGI MARA

# EXTRACTION OF TURMERIC ESSENTIAL OIL BY USING HYDRODISTILLATION

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# ABSTRACT

Turmeric or its binomial name of Curcuma Longa is a rhizomatous herbaceous perennial plant of the ginger family, which is Zingiberacaeae and it is said to be originated from subdivision of Indian continent and Southeast Asia. Turmeric plant is growth around India, Asia and Central America. Curcuma longa or turmeric has been used widely for kitchen spices and for analeptic uses. Moreover, turmeric has been used in Ayuverdic medicine long time ago which in South Asia for many conditions that includes breathing problems, serious pain, rheumatism and fatigue. They live in temperature above 20°C and 35°C which will grow in warm and humid climate. The plant could reach 4 feet in height. The rhizome appears as fleshy oblong tuber with length of 2-3 inch. The internal part of the rhizome is firm and come with yellow to orange in coloured and have rings at the body of turmeric rhizome. Turmeric oil is in light yellow to dark orange liquid color and have characteristic of aromatic odour of the spices. The major compound found in turmeric essential oil are Curcumin and Turmerone. Curcuma longa or turmeric, of the Zingiberaceae family, has a great importance in the food, textile, and pharmaceutical industries. The aim of this work was to extract and compare turmeric essential oil from fresh turmeric rhizomes between two different sources which from Pasar Moden Seksyen 6 Shah Alam and Pasar Besar Klang and characterization of turmeric essential oil done by using FTIR. 200 grams of sample is used that were extract in hydro-distillation which Clevenger type distillation with 500 mL of distilled water. The time of extraction were set up to 2, 4, and 6 hours. . From the discussion sample from Pasar Moden Seksyen 6 Shah Alam give the highest yield which is 0.5445% at 6 hours of extraction while the other sample give 0.37% at 6 hours of extraction. FTIR prove the presence of Ar-curcumene in the essential oil by having benzene ring peak at 1617.61 $cm^{-1}$ . The aromatic ring found was proved that Ar-Turmerone and Curlone were in the sample because of aromatic ketones found at the peak 1684.10 $cm^{-1}$. So, it can be prove that the oil analyze is turmeric essential oil because it should contain Curcumene and Turmerone in the essential oil.

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# CHAPTER 1
# INTRODUCTION

## 1.1 RESEARCH BACKGROUND

Turmeric or its scientific name Curcuma Longa is a rhizomatous herbaceous perennial plant of the ginger family, which is Zingiberacaeae and it is said to be originated from subdivision of Indian continent and Southeast Asia. There are about as many as 133 species of Curcuma have been identified worldwide. Turmeric is growth around India, Asia and Central America. The largest producer of turmeric is India. India also is found to be the largest consumer and exporter of turmeric in the world. The plant could reach 4 feet in height and produces both a flower and a rhizomes or stem that is found underground. Moreover, turmeric has been used in Ayuverdic medicine long time ago which in South Asia for many conditions that includes breathing problems, serious pain, rheumatism and fatigue.

Essential oil extraction is a chemistry separation process which occur isolation of oil in plant material such as root, wood, nuts, flowers and leaves. Essential oils are widely used in variety consumer products like soaps, detergents, pharmaceutical, food product and cosmetic. The production and consumption of essential oil are very fast. So, technology in oil extraction is needed to improve yield and quality of essential oil. There are many ways to extract essential oil, most common used method is steam distillation. Some industry used solvent-based extraction method that involves chemical in the extraction. These methods are not considered to be therapeutic grade because they may not offer same benefits as essential oil that extracted by using steam distillation. Some chemicals used in solvent-based extraction can alter the properties and destroy the benefit of essential oils. Moreover, some way to extract essential oil is by using Superficial Carbon Dioxide Extraction, Hydro-distillation, Enfleurage and Maceration.

Turmeric oil is in light yellow to dark orange liquid color and have characteristic of aromatic odour of the spices. The yellow colour of turmeric is because the presence of