ABSTRACT

An important medicinal plant, Curcuma longa L, is being used to treat several diseases anciently. It is one of the species of the family *Zingiberaceae* and is commonly referred to as turmeric. It has many pharmacological properties such as antifungal, antiviral, anti-inflammatory, antibacterial, and antioxidant. It promotes wound healing and inhibits the development of bacteria and fungi. *I*n markets, thousands of antimicrobial products include harmful chemicals like triclosan used in hand sanitizers and soaps. This research aimed to use a natural medicinal plant to produce an organic product. This study evaluates the estimation of chemical components of *Curcuma longa* rhizomes. The Clevenger hydro-distillation method was used to extract the essential oil. The total yield of essential oil of *Curcuma longa* L. rhizome represented 3.93%. Gas Chromatography-Mass Spectroscopy (GC-MS) was used to examine the essential oil. It has been found that ar-turmerone, curlone, turmerone, Zingiberene, and ar-curcumene are present in the essential oil. Turmeric fatty oil was extracted with Soxhlet apparatus, and the yield was 6.66%. The fatty oil was analyzed using Gas Chromatography-Flame Ionization Detection (GC-FID). These extracts' residue underwent proximate analysis using standard techniques. According to the investigation, essential oil residue contains 1.03 percent crude protein, 9.92 percent crude fiber, 1.08 percent fat, 5.16 percent moisture content, and 6.17 percent ash. 6.15 percent moisture, 6.18 percent ash, 1.53 percent crude protein, 9.92 percent crude fiber, and 1.92 percent fat make up fatty oil residue. Finally, the potential application of *C. Longa* rhizome oil in the cosmetic industry, such as antimicrobial bar soap, is included. Regarding the data, *C. Longa* rhizome essential oil may play a unique role in the cosmetic industry. The antimicrobial activity of antimicrobial soap was tested using Agar well diffusion on gram-positive bacteria, including *Bacillus subtilis, Staphylococcus aureus, and Salmonella typhimurium* and gram-negative bacteria (*Escherichia coli, Klebsiella pneumoniae, and Pseudomonas aeruginosa*). It was contrasted with a bar of baby soap and Lux. The maximum zone of inhibition was shown by *Bacillus subtilis, Pseudomonas aeruginosa,* and E*scherichia coli,* which were 20 mm, 24 mm, and 24 mm, respectively.