

Minerals Evaluation, Antibacterial Activities and Antioxidant Activities of *Zingiber officinale* Roscoe (ခဲး)

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Abstract

Medicinal plants act as an indigenous source of new compounds possessing therapeutic value and can also be used in drug development. Owing to its minimal toxicity, cost effectiveness and pharmacologically active, 80% of population in developing countries depend on traditional medicines, mostly natural plant products, for their primary health care needs as estimated by World Health Organization. A number of minerals essential to human nutrition are accumulated in different parts of plants. The alarming increase in the rate of infection by antibiotic resistant microorganisms has urged scientists to search for compounds which have potential antimicrobial activity. Antioxidants are vital substances which possess ability to protect the body from damage caused by free radical induced oxidative stress. The purpose of current study was mineral evaluation, antimicrobial activities and antioxidant activities of *Zingiber officinale* Roscoe, ginger (ခဲး). Atomic absorption spectrophotometer and UV - Visible spectrophotometer were used for determination of minerals and antioxidant activities. Antibacterial activity was determined by agar disc diffusion method (WHO, 2003). Broth dilution method was used for determination of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC). Macrominerals content of ginger were within permissible limit of Ajasa, 2004 and content of microminerals were within permissible limit of vegetables set by FAO/WHO, 2001. Ginger extracts showed zone of inhibition 12 mm – 15 mm against *Pseudomonas aeruginosa*, 7 mm – 9 mm against *Staphylococcus aureus* and 12 mm – 15 mm against *Escherichia coli*. Although MIC and MBC of aqueous extracts did not show the concentration up to 10 mg/mL, MIC of ethanolic extract was observed in the range from 1 mg/mL to 8 mg/mL and MBC from 2 mg/mL to 9 mg/mL. The antioxidant activity of aqueous extract of ginger (IC₅₀: 0.022 µg/ml) and ethanolic extract (IC₅₀: 0.333 µg/ml) were comparable to well-known antioxidant, ascorbic acid (IC₅₀: 0.59 µg/ml). Thus, ginger has strong free radical scavenging activity. These

findings indicated that, ginger has potential to provide nutrients to human beings, preventive properties against oxidative damage and some pathogens. These results were give scientific information for herbal medicine users, local practitioners, standardization & quality control of precious indigenous drug and pharmaceutical industries using ginger for different types of ailments.