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EVALUATION OF ANTI-MICROBIAL, ANTIOXIDANT AND ANTI-INFLAMMATORY EFFECTS OF *ROGHANE KHAS*

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Antimicrobial resistance is a critical global health challenge necessitating new therapeutic agents. This study evaluates the traditional Unani formulation *Roghane Khas*, composed of *Edaru* leaves (*Ricinus communis*), *Vara* leaves (*Calotropis gigantea*), *Aththana* leaves (*Datura metel*), bee's wax, *Girisindura* (Red lead), *Keppetiya lakada* (Resin of *Coccus lacca*), and sesame oil, known for its antimicrobial, antioxidant, and anti-inflammatory properties. *Roghane Khas* 's antimicrobial efficacy was tested against bacterial strains such as *Staphylococcus aureus, Escherichia coli, Bacillus subtilis, Pseudomonas aeruginosa, Streptococcus pyogenes,* and *Proteus mirabilis*, as well as the fungus *Candida albicans* using the well diffusion method. The antioxidant properties were assessed using DPPH (2, 2-diphenyl-1-picrylhydrazyl) and FRAP (Ferric Reducing Ability of Plasma) assays, and the anti-inflammatory effects were evaluated using the HRBC (Human Red Blood Cell) membrane stabilization method. The results of well diffusion method showed significant inhibition zones ranging from 9.40 ± 1.22 mm to 12.60 ± 1.97 mm and 9.50 ± 1.22 mm to 11.46 ± 1.97 mm for the DCM (Dichloromethane) extraction and hexane extraction respectively, indicating strong antimicrobial activity. The antioxidant assays revealed potent radical scavenging for DCM extract with IC_{50} value of 12.56 µg/mL while the hexane extract showed moderate activity with an IC_{50} value of 217 µg/mL and ferric reducing capacities comparable to standard antioxidants. The HRBC membrane stabilization method demonstrated significant inhibition of inflammation, with percentage inhibitions of 61.57% for the DCM extract and 29.96% for the hexane extract and 50.28% for the methanol extract at 1 mg/mL concentration. These findings support the traditional use of *Roghane Khas* as a multifunctional therapeutic agent. The study concludes that *Roghane Khas* exhibits potent antimicrobial, antioxidant, and anti-inflammatory activities, highlighting its potential application in modern medicine to combat antimicrobial resistance. Further research is recommended to elucidate the mechanisms and clinical applications of *Roghane Khas.*

Keywords: antimicrobial resistance, traditional medicine, *Roghane Khas,* antioxidant activity, anti-inflammatory activity