Antimicrobial Activity of Garlic and Ginger Extracts Against Oral Bacteria

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Antibiotic resistance is becoming a problem, especially in COVID-19 -- but for centuries especially in the ancient Indian form of medicine Ayurveda, plant-based forms of medicine have been used to ward off bacteria. The purpose here was to demonstrate the efficacy of garlic and ginger against Streptococcus mutans. Hypothesis: if S. mutans was treated with garlic and ginger (GG) extracts, then bacterial growth would be inhibited. GG extract was made using 100g of garlic bulbs and ginger root. It was combined with water, then filtered/sterilized through a paper filter/vacuum pump. Final solution was 250 micrograms/ml. S. mutans was cultured in an agar plate with serum. 6 mm discs were punched with Whatman No.1 filter. Discs were sterilized by autoclaving. Crude-extracts were prepared, dissolving 0.5 grams of the GG solution into 5 milliliters of dimethyl sulphoxide. Concentrations of the GG extract were made – 100, 250, and 500 microgram/mL, yielding 1.0, 2.5, and 5.0 microgram disc potencies. 3-5 colonies of S. mutans were isolated, then emulsified into 3 mL of saline. Concentrations of GG were inoculated into discs on agar plates. Plates were inverted/incubated at 37^C for 24 hours. Kanamycin was a positive control. The zones of inhibitions were measured. Experiments were performed thrice. Across trials for the extract, zones measured 1.41 cm, 2.19 cm, and 2.69 cm (4.03 cm of Kanamycin). Of the micrograms of plant extracts effective to 25 micrograms Kanamycin, 100 : 33.4% of 25 micrograms, 250 : 53.1% of 25 micrograms, and 500 : 66.7%percent of 25 micrograms. Therefore, this establishes GG extract as a strong natural antibiotic.

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