Differentiating the Effect of Aqueous-based Synthetic and Natural Antibiotic Hybrids in a Model of an Infected Terminal Ileum of the GI Tract, Year Four

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The basis of this continuation experimentation has evolved from the growing threat of antibiotic resistance. This experiment investigated the effects of synthetic antibiotics and natural antibiotic hybrids in an aqueous solution against Staphylococcus aureus, Pseudomonas aeruginosa, and Streptococcus pneumoniae, through a modeled terminal ileum of the GI tract. The study involved constructing the hybrids in specified ratios (50%, 37.5%, 25%, 18.75%, and 12.5%) amongst Piper betel leaf (betel leaf), Azadirachta indica (neem), and Ocimum tenuiflorum (holy basil), which served as the natural antibiotic hybrid stock group. Conversely, the synthetic antibiotic stock group were represented by fine-grained solute by the means of kanamycin and ampicillin. Both groups were induced in a model of the terminal ileum, which had cultures of each bacterium. Statistical, data, and image analysis was then conducted to see alters in colony size, spread, and count. Overall, this study formed the conclusion that distinguishes the concentration ratio that allows for the greatest bacterial defense in an in vitro model. This study served as an extension to my previous three years of experimentation. Conversely, to my preceding studies, this research superiorized the concept of stock enactment upon the human gastrointestinal microbiota. Series of image analysis procedures were enacted upon the singular colony sizes, colony cumulative spread of the bacteria, and the supplementary colony quantity analysis. Methodologies of image analysis consisted of calculation of area and pixel value statistics of colonies. Further programs included the identification and cataloging of microbial growth. Importantly, analysis of data outputs were completed through series of MANOVA, ANOVA, and paired t-tests.

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