Empowering the Antibacterial and Antifungal Effects of Juglone by Obtaining Juglone: Beta Cyclodextrin Binary System for Pharmaceutical Purposes

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The overuse of substances with antibacterial and antifungal properties cause drugs to lose their efficiency because of the resistance that microorganisms started to develop. By using the Juglone-beta Cyclodetrin Binary System, we aimed to prove that certain properties of Juglone (that is widely used in medicine) can be improved, thus offering a greater solution to solving the global problem of microorganisms' resistance and replacing the synthetical drugs with natural ones. The System was applied on Staphylococcus Aureus (gram positive), Escherichia Coli (gram negative) bacteria and Candida Albicans fungus, in different Juglone/beta Cyclodextrin ratios in order to observe the different efficiencies. Compared to pure Juglone, the Juglone-Beta Cyclodextrin System in ratios of 2:1 and 1:1 occurred to have a better efficiency on all 3 cultures, having a lower Minimum Inhibitory Concentration (pure Juglone: 0,0625 mg/ml on Staphylococcus Aureus and Escherichia Coli, 0.25 mg/ml on Candida Albicans, and 2:1 ratio – 0,015625 mg/ml on both Staphylococcus Aureus and Escherichia Coli, 0,0625 mg/ml on Candida Albicans). The study showed that the Juglone-beta Cyclodextrin Binary System is more efficient than pure Juglone, thus giving it a great potential in future medicine use. The universality that our system showed on all 3 different cultures makes it a highly innovative discovery, that could replace the synthetical antibiotics with natural ones, lower the prices and cure the inflammations and infections faster.

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