DEVELOPMENT OF ANTI-COVID-19 HERBAL COMBINATIONS IN MICRO AND NANOEMULSION FORMS AND TESTS OF ITS ACTIVITY AS IMMUNITY RESPONSE MODULATOR

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ABSTRACT

The aim of this study was to develop a herbal combination formulation of turmeric (Curcuma longa), meniran (Phyllanthus urinaria), Sambiloto (Andrographis paniculata), Ginger (Zingiber officinale), Lemongrass (Cymbopogon citratus), and Lemon (Citrus limon) in the form of micro and nanoemulsions and test its activity as an immunomodulator in vitro and in vivo. The method used in this study was the preparation of aqueous and ethanol extracts of herbal combinations from A. paniculata and P. urinaria herbs, C. longa and Z. officinale rhizomes, C. limon fruit, and C. citratus , preparation of nanoemulsion herbal extract combinations, testing in Vivo nanoemulsion activity of combined herbal extracts, and in silico activity test of chemical compound components in each plant A. paniculata and P. urinaria herbs, C. longa and Z. officinale rhizomes, C. limon fruit, and C. citratus molecularly dock. The results showed that herbal combination extracts in the form of micro and nanoemulsions had potential as immunomodulators, which showed that there was an effect of natural and adaptive immune responses such as increasing the number of white blood cells, as well as decreased expression of IL-6 cytokines and IFN-gamma cytokines between the control group. and treatment. The results of determining the mechanism of its activity by molecular docking of the main protein (MPRO) of SARS-CoV-2, with comparisons of remdesivir, favipiravir, and ritonavir showed that the chebulanin compound, albibrissinoside found in meniran plants has better antiviral activity compared to the positive control drug compound , as well as neoandrographolide in Sambiloto and hesperidin in Citrus Lemonia also have good activity.

Kata Kunci: *herbal combinations, nanoemulsion, boster imun, anti-covid-19*