Herbal Nanoparticles (Plant Crystals) and Extract- A Safe Alternative to Combat Anopheles culicifacies and Aedes aegypti

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This study aimed to combat two important species of mosquitoes, Anopheles culicifacies and Aedes aegypti that transmit human diseases. In this research, botanical pesticides were used as an alternative to synthetic chemical pesticides to control mosquitoes. Aqueous extracts and volatile oils were extracted from four Omani traditional medicinal plants viz., frankincense, zimouta, thyme and basil. Nanoscale solutions of medicinal plants were made by using centrifuge without using any chemical solvents. Then, different concentrations of plants extracts and nanoscale solutions were tested against mosquito larvae. After that, the results were compared with the controls and chemical pesticides. The results showed that percentage mortality of the larvae of Anopheles culicifacies was affected by the extracts of zimouta and basil at concentrations of 10%, 5% and 1% and ranged from 96.3% to 100%. However, their mortality rate with frankincense and thyme extract at concentrations of 10%, 5% and 1%, was almost 100%. Moreover, the mortality rate of the larvae of Anopheles culicifacies mosquito and Aedes aegypti mosquitoes by the effect of nanoscale plant solutions ranged from 74% to 100%. On the other hand, compared to the control experiments, the mortality rates of the larvae of both kinds of mosquito did not exceed 3.7% in some experiments. However, temphos pesticide caused 100% mortality of mosquito larvae. To conclude that the mortality rate of larvae of both kinds of mosquito by using botanical pesticides was equivalent to mortality rate of the larvae by chemical pesticides. These botanical pesticides may be safer and environmentally friendly.

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