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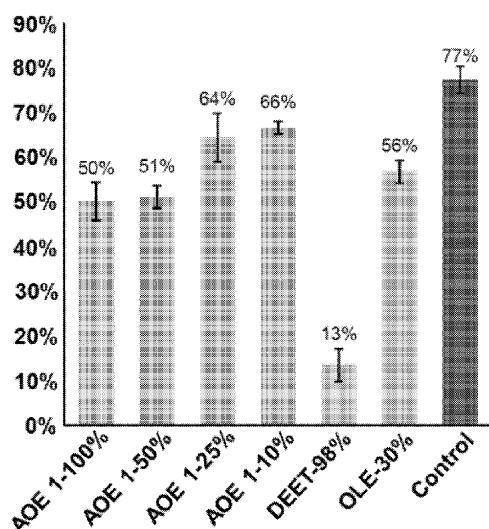


Figure 4

(57) Abstract: Health concerns of the vector-borne diseases, such as, yellow fever, malaria, dengue fever and general discomfort due to insect bites, has encouraged the development of insecticides to kill insects and insect repellents to keep insects away from treated human skin. Annatto extracts as a natural insect repellent and insecticide have many advantages over synthetic such as lower harmful side effects, low resistance, and more environmentally friendly. Annatto extracts containing ishwane (C15) and geranyl- α -terpinene (C20) have strong mosquito repellency. Annatto extracts containing geranyl- α -terpinene (C20) and geranylgeraniol (C20) have strong larvicidal activity. Annatto extracts with approximately equal C15 and C20 composition have insect repellency, and annatto extracts with mainly C20 composition have larvicidal activity. Annatto extracts have synergistic effects with other natural extracts.

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