



## Semi-field evaluation of some natural clean insecticides from essential oils on armored and soft scale insects (Homoptera: Diaspididae and Coccidae) infesting mango plants.

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**Abstract:** This work was carried out to overcome the resistance phenomenon of armored and soft scale insects against conventional scalicides; and to find promising methods to control these insects; besides reducing environmental hazards. Therefore, formulations of Demso, Oregacide, Citroicide and Lemocide were prepared and investigated against white mango scale *Aulacaspis tubercularis* (=mangifera), yellow scale *Aonidiella citrina* and acuminata scale *Kilifia acuminata* in comparison with the trade neem oil "Trilogy". The obtained results cleared that adult females of *A. tubercularis* responded to these oils by nearly similar percent of reduction 81.86, 87.89, 85.58, 84.39 and 81.03% when sprayed with Demso, Oregacide, Citroicide, Lemocide formulations and Trilogy, respectively. Nymphs population were reduced by 74.08, 88.66, 81.24, 74.1 and 76.92% when sprayed by the same formulations, respectively. Both adult females and nymphs population of *A. citrina* were reduced by 93.74, 95.09, 67.34, 50.42 & 68.46% and 99.31, 99.05, 84.09, 80.29 & 90.67% when sprayed with Demso, Oregacide, Citroicide, Lemocide & Trilogy, respectively. Both females and nymphs of *K. acuminata* were reduced by different values.

The combined effect of tested oils on different insect species and different stages together, referred that Lemocide had the lowest effect on tested insects (51.13% reduction); while Oregacide had the highest effect on armored and soft scale insects collectively (95.03% reduction) in comparison with 80.98% of reduction resulted from Trilogy formulation.

Physico-chemical properties of the tested formulations revealed that, all formulations passed emulsion stability, except the commercial compound Trilogy.

Concerning the side effects on chlorophyll, treatments with Demso and Oregacide were effective on increasing chlorophyll contents with time elapsed. Also, nutrient elements such as Fe and Mg increased by these treatments.

**Key words:** Natural compounds, Essential oils, *Aulacaspis tubercularis*, *Aonidiella citrina*, *Kilifia acuminata*, Mango orchards.