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# Title : Essential oils used against two main biting-sucking insects for the improvement of seed and fiber quality of cotton plants

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## Background

- In recent years, in all cotton production areas in Côte d'Ivoire, whitefly (*Bemisia tabaci*) and jassid (*Jacobiella facialis*), two biting sucker insects causing depreciation of quality of the cottonseed and fiber obtained at harvest, have emerged.
- However, the excessive use of synthetic chemical insecticides against these pests represents a danger for the sustainability of the production system.

## Objective

The aim of this study was to evaluate the insecticidal efficacy of essential oils on the main stinging-sucking pests, such as whitefly (*Bemisia* tabaci) and jassids (*Jacobiella fascialis*), and on the technological parameters of cotton seed and fiber

## Methodology

**Step 1 : Collecting leaves**

**Step 2 : essential oil**

**Step 3 : Field application**

## Results

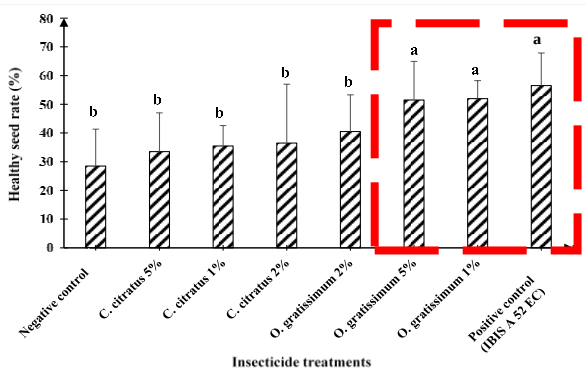
### ► Insecticidal activity of essential oils

The results showed that *O. gratissimum* essential oils at concentrations of 1 and 5% gave the cotton plants better protection against whitefly and jassid flies.

| Insecticide treatments | *B. tabaci* | *J. fascialis* |
|---|---|---|
| *O. gratissimum* 1 % | 4.24±0.90ab | 15.95±2.65a |
| *O. gratissimum* 2% | 4.11±0.30ab | 14.64±0.65a |
| *O. gratissimum* 5% | **3.38±0.53a** | **14.42±1.28a** |
| *C. citratus* 1 % | 3.77±0.51ab | 17.33±2.46a |
| *C. citratus* 2 % | 4.26±1.55ab | 16.26±1.72a |
| *C. citratus* 5 % | 4.51±0.40ab | 16.77±2.40a |
| Positive control | 7.40±0.37c | 17.02±2.23a |
| Negative control | 4.93±1.04b | 16.26±2.35a |
| Probabilities (P) | 0.000 | 0.610 |

### ►Seed health following essential oil-based biopesticides

Cotton plants protected with biopesticides concentrated at 1% and 5% of essential oil of Ocimum gratissimum produced a rate of healthy seeds relatively similar to those from chemical protection (52.00, 51.50 and 56.50% respectively).




### ► Health status of cotton fibre using essential oil-based biopesticides

The products applied had a very significant effect on the reflectance of the cotton fibres ($p<0.001$). The highest values were recorded for treatments with 1 and 5% ***O. gratissimum*** **essential oil (76.40% and 76.30% respectively)**. Similarly, the products had a highly significant effect on the yellow index of the cotton fibre ($p<0.001$). On the other hand, application of 5% ***O. gratissimum*** **extract gave the lowest value (9.70).**

| Traitements insecticides | RD (%) | b+ |
|---|---|---|
| *O. gratissimum* 1 % | **76.40a** | 9.90b |
| *O. gratissimum* 2% | 74.8bc | 11.90d |
| *O. gratissimum* 5% | **76.30a** | 9.70a |
| *C. citratus* 1 % | 73.50d | 11.60d |
| *C. citratus* 2 % | 74.00c | 11.90d |
| *C. citratus* 5 % | 74.10c | 10.10b |
| Positive control (IBIS A 52 EC) | 75.20b | 10.10b |
| Negative control | 74.10c | 10.70c |
| Probability (P) | 0.00 | 0.00 |

**RD** : reflectance , **b+** :yellow index

## Conclusion

The essential oil of *O. gratissimum* could therefore be integrated into plant protection programs for cotton in Côte d'Ivoire.