

Evaluation of the attractiveness of sex pheromone traps for the cocoa mirids *Sahlbergella singularis* Hagl. and *Distantiella theobroma* Dist. (Hemiptera: Miridae)

Field trapping experiments at the IRAD-Nkoemvone research station

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Introduction

Cocoa mirids, *Sahlbergella singularis* Hagl. and *Distantiella theobroma* Dist. are the two major pests of cocoa in West Africa, causing 30 to 75% loss of production. Currently, in order to limit mirid damage, insecticide spraying is the preferred control method. However, there are many problems associated with insecticides, such as the high costs of chemicals, the development of pest resistance, the destruction of non targeted organisms and the pollution of the environment through an accumulation of pesticide residues in the soil, water and food chains. These constraints have led to the development of research towards a more Integrated Pest Management (IPM) approach for cocoa mirids.

The aim of our study was to contribute to the improvement of mirid control strategies, by using a synthetic female sex pheromone.

Results

Diversity of trapped insects

- ❖ 473 individuals / 20 families / 7 orders
- ❖ 299 out of 473 specimens were from the species *Sahlbergella singularis*

Sahlbergella singularis



Table 1: Number (%) of *S. singularis* caught per pheromone traps including control traps for the duration of the study

| A | B | C | D | E | Control | Total |
|--------|---------|---------|---------|--------|---------|--------|
| 22 | 68 | 72 | 98 | 27 | 12 | 299 |
| (7.4%) | (22.7%) | (24.1%) | (32.8%) | (9.0%) | (4.0%) | (100%) |

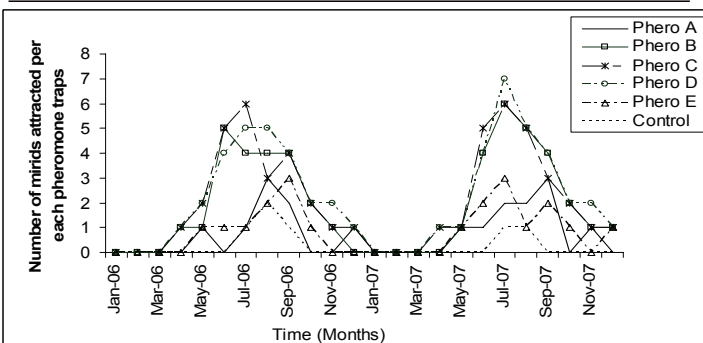


Fig. 1: Monthly number of *S. singularis* attracted/caught in pheromone traps

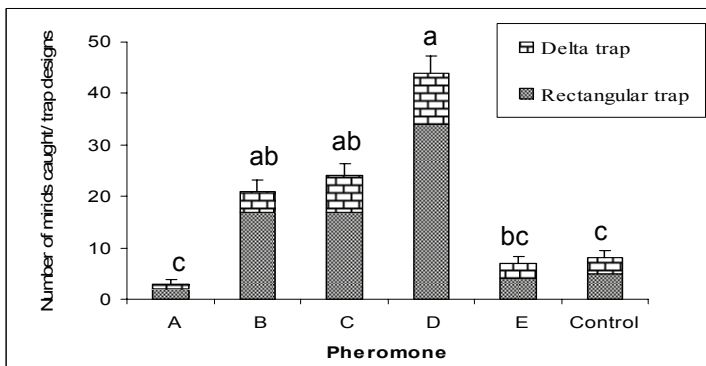


Fig. 2: Comparison of the numbers of mirids caught in both trap designs in function of the different pheromone compositions

Acknowledgements

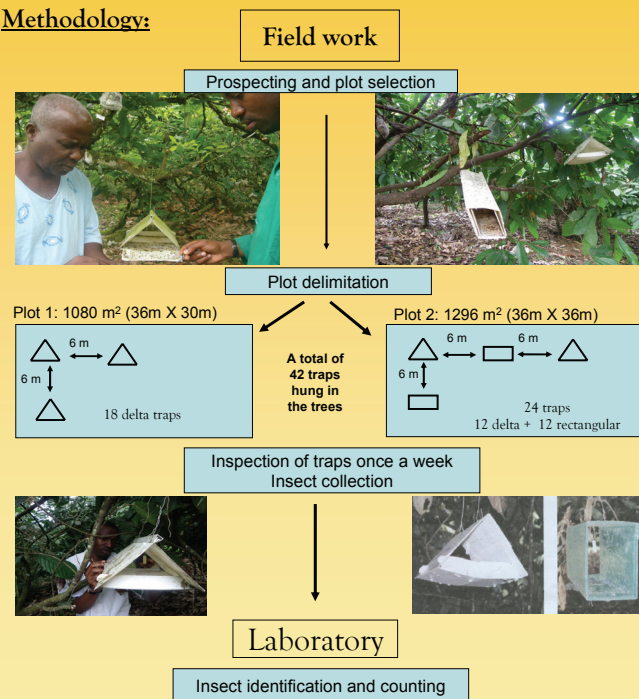
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Materials & Methods

Study area: Nkoemvone (humid forest, southern Cameroon), 2°40'N and 11°20'E, altitude = 630m, T = 25°C, annual rainfall = 1700 mm.

Pheromones, traps and experimental design: we used 5 different blends of diester and/or alcohol, noted A, B, C, D and E, with the respective corresponding ratios (V:V): 1000:0, 1000:50, 1000:500, 1000:1000 and 0:1000.

Methodology:



Statistical analysis: comparison of the average number of mirids per plot and per trap with an anova following by a Tukey's post hoc test

Discussion & Conclusion

The differential and selective attractiveness to *S. singularis* (particularly the male adults) of the different compositions of the pheromones tested were certainly due to differences in formulation. The pheromone compositions which contained both molecules (diester and alcohol) B, C and D were more efficient than those who possessed only one or none (A, E and the control) in terms of the attractiveness to mirids.

Rectangular traps caught more males (73.83%) compared to Delta traps (26.17%), but this was likely due to its larger surface area (2.075 cm² compared to 1.204 cm² for the delta trap).

A sex female pheromone formulation with both compounds (diester and alcohol) notably the pheromone compositions B, C and D and particularly D together with the Rectangular trap design have a good potential to lure and thus suppress mirid populations in cocoa, particularly the male adults of *S. singularis*. Pheromone composition and trap design are important parameters to maximise efficiency of these components in an IPM approach for mirid control.



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