SEMIO workshop

# SEMIO-Workshop

A platform for African and non-African scientists
on insect chemical ecology and integrated pest management
www.semio-workshop.org

2011-11-12

Dear all,

SEMIO-11 is a platform for collaborations between African and non-African scientists in the field of chemical ecology and integrated pest management. We welcome all almost 80 participants to *icipe* in Nairobi for three days of inspiring presentations and interesting discussions!

The aim of the meeting is to highlight and discuss potential areas for further research to ensure food security and sustainable development. Focus is on plant protection and vector management, and the potential of chemical ecology as a tool in multilevel IPM strategies.

SEMIO-11 is a follow-up to the SEMIO-08 meeting, held in 2008 in Arusha, Tanzania, that sparked several collaborative projects. We hope that SEMIO-11 will be equally fruitful, strengthening ongoing collaborative ties, promoting new networks and highlighting new openings for an integrated approach in pest management research.

The current webpage with which you are familiar (http://semio-workshop.org/) will remain active and updated also after the workshop. Please do visit the website and comment how we can improve its functionality to serve its community best.

For the organizing committee,

Teun Dekker Ylva Hillbur

Ylva Hillbur, Teun Dekker - Swedish University of Agricultural Sciences, SLU
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***Acknowledgements:*** *Special thanks to* icipe *for hosting the meeting as well as supporting it financially. SEMIO-11 is to a very large extent supproted through UD40-funding. UD40 is an initiative from the Swedish Ministry of Foreign Affairs, administered through the Swedish University of Agricultural Sciences. Funding for additional travel grants have generously been provided by the International Society of Chemical Ecology, the International Foundation for Science, Max Planck Institute for Chemical Ecology, Pheronet, Rothamsted Research and ChemTica Internacional.*

## Potential and limits of "assisted" push-pull strategies for the management of pests of staple food and horticultural crops in Sudano-Sahelian agroecosystems

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The "push-pull" strategy is a stimulo-deterrent diversion technique whose principle consists in repelling the insect pest from the main crop using repellent ("push") crops and attracting it to the border of the cropped field using trap ("pull") plants. Conversely, some "push" plants may attract (via "pull" stimuli) natural enemies of pests in the crop/field. In these systems, pest and natural enemy behaviour is mediated by visual and semiochemical cues, some of the latter being produced during damage to plants by pests. The main example of successful implementation of "push-pull" principles is that of stem borer management by ICIPE and its partners in Eastern Africa. However, there are many limits to the generalization of such a pest management strategy. To extend the range of its application and delay potential dangers of dead-end trap plants on the long term, one should not rely on mere plant species diversity arrangement in agroecosystems, but mimick or re-inforce the processes at play, which results in "assisted" push-pull. We report such potential and limits of the push-pull principles, their application and their extensions, based on our experience in the context of Sudano-Sahelian staple-food and horticultural crop-based cropping systems of West Africa. For instance, a neem extract was assessed in Burkina Faso for potential repelling effects on vegetable fruit flies on zucchini, as a complement to "assisted" trap-cropping using spot-spraying with GF-120. Results on okra from Niger question the potential of spraying neem extract as complementary to trap-cropping with pigeon-pea, in a "food-web optimization" perspective. On the other hand, the potential of GF-120 for controlling both the monophagous Ziziphus fruit fly and polyphagous cucurbit fruitflies in a cropping system, via two radically opposite semiochemically-mediated pathways, is also highlighted. Results from earlier studies in Mali shed a new light on prospects for using some sorghum cultivars and physic nut extracts in an assisted trap-cropping strategy for protection of high-value crops such as cotton. In such "assisted push-pull" strategies, care should be taken that only repellent effects on the main crop, and only insecticidal or deterrent effects (depending on the pest stage targeted) on the trap crop are at play and,. This requires further chemical ecology studies on the deterrent *vs* repellent *vs* insecticidal *vs* attractive effects of plants and plant extracts vis-à-vis crop pests and their natural enemies, in view of quantifying responses from the insects, that will help parameterize individual-based spatially explicit models as tools to improve our understanding of plant-herbivore-natural enemies interactions and optimize pest management in Sudano-Sahelian agroecosystems.