Modelling Palm-Pollinator interactions. Comparison on two "opposite" modelling approaches.

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Pollination of young palm trees in Asia is mainly due to an introduced weevil, *Elaeidobius kamerunicus*. The pollinators congregate and multiply only on male inflorescences in anthesis (during flower opening). Then, loaded with pollen grains, they may visit female flowers and pollinate them, more or less, effectively. However, this entomophilous pollination is not always sufficient to have a good fruit set. In particular, because the density of male inflorescences per hectare is often low in (young) plantations. That is why it is important to study and understand the mutualistic interactions between the inflorescences and the weevil population, despite the fact that we have partial knowledge.

The aim of this talk is to present a mathematical model and to compare it with an Individual-Based approach [1]. Using the qualitative analysis of the mathematical model, and numerical simulations, we will discuss the main outcomes of both models that may help us to elaborate new observations, new experiments, or to understand how to sustain this mutualistic system. Finally, based on old published data [2], we try to estimate the mean number of male inflorescences per hectare necessary to maintain a population above a certain threshold in order to reach a good fruit set.

References

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