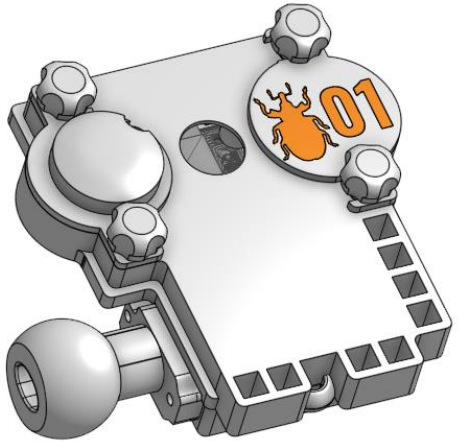
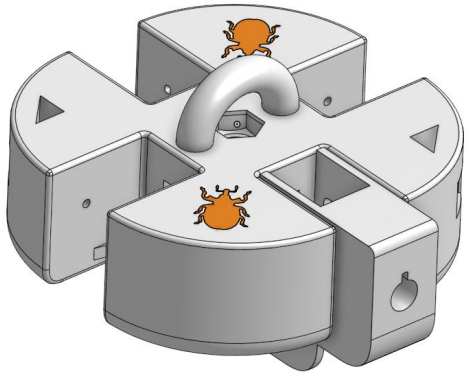
Contribution du design 3D à l'étude des interactions plantes-insectes en terrain difficile, les canopées des forêts tempérées et tropicales

Rémi Allio & Julien Foucaud





Scientific Context and Motivation

Scientific Context and Motivation

Weevils pollinating Annonaceae species

Current Biology
Report

CellPress

Parasitoids Turn Herbivores into Mutualists in a Nursery System Involving Active Pollination

Carlos Eduardo Pereira Nunes,[1,4,*] Pietro Kiyoshi Maruyama,[1] Marianne Azevedo-Silva,[2] and Marlies Sazima[3]
[1]Postdoctoral Fellow at Department of Plant Biology, Institute of Biology, P.O. Box 6109, University of Campinas - UNICAMP 13083-970, Campinas, SP, Brazil
[2]PhD Candidate at Programa de Pós-Graduação em Ecologia, Institute of Biology P.O. Box 6109, University of Campinas - UNICAMP 13083-970, Campinas, SP, Brazil
[3]Professor at Department of Plant Biology, Institute of Biology P.O. Box 6109, University of Campinas - UNICAMP 13083-970, Campinas,

Pollination syndrome of the African custard apple (*Annona senegalensis* Pers.) reveals reliance on specialized brood-site weevil pollinators in Annonaceae

Int. J. Plant Sci. 167(3):483–493. 2006.

1058-5893/2006/16703-0009$15.00

Zézouma Anselme Dao[1] · Rahim Romba[1] · Bruno Jaloux[2] · Julien Haran[3] · Amadé Ouédraogo[4] · Olivier Gnankiné[1]

REPRODUCTIVE BIOLOGY OF TWO SYMPATRIC SPECIES OF *POLYALTHIA* (ANNONACEAE) IN SRI LANKA. I. POLLINATION BY CURCULIONID BEETLES

R. M. C. S. Ratnayake,* I. A. U. N. Gunatilleke,† D. S. A. Wijesundara,‡ and R. M. K. Saunders[1,*]
*Department of Ecology and Biodiversity, University of Hong Kong, Pokfulam Road, Hong Kong, China; †Department of Botany, University of Peradeniya, Peradeniya, Sri Lanka; and ‡Royal Botanic Gardens, Peradeniya, Sri Lanka

While *Prosopanche* (Hydnoraceae) flowers gently heat: mutualistic pollination relationships among the perianth-bearing Piperales

Nicolás Rocamundi[1,*], Marina Arce Miller[1], Constanza C. Maubecin[1], Carlos Martel[2,3], Marcela Moré[1], Adriana Marvaldi[4] and Andrea A. Cocucci[1]

Section: Ecology
Topic: Ecology, Environmental sciences, Biology of interactions

Most diverse, most neglected: weevils (Coleoptera: Curculionoidea) are ubiquitous specialized brood-site pollinators of tropical flora

Haran, Julien[1] ; Kergoat, Gael J.[2] ; de Medeiros, Bruno A. S.[3, 4]

PCI
peercommunityin.org

~ 300 weevil species
40 genera
3 families

~ 250 plant species
73 genera
23 families

At least 2000 plant and 2500 weevil species

Apprehend this massive and undescribed biodiversity

- **Widespread** in tropical biomes but **overlooked**
- Inconspicuous relationships :
  crepuscular canopy flight, small species, etc

A lot remain to be discovered : weevil species & interactions

Field expeditions

Museomics

Pollen Metabarcoding

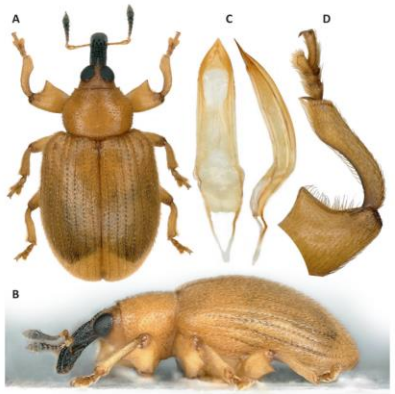
Gabon 2023 – PolTroN – CEMEB labex

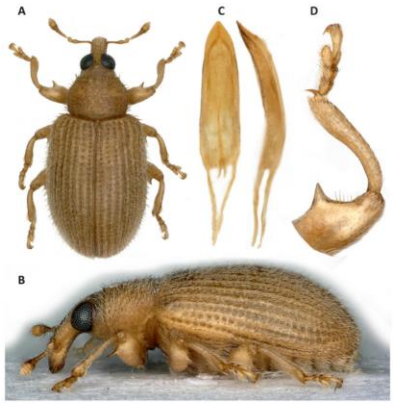
Objective: Intercept flying weevils at night and extract the pollen they carry to identify their host plant.

SUCCESS!

Numerous morphospecies of the targeted group of weevils found at night!

Most of them new to Science





Haran et al. *submitted*

Challenges and Lessons Learned – Behind the scene

How to bring the light trap in the canopy?

How to collect so many specimens while you are there?

Challenges and Lessons Learned – Behind the scene

How to bring the light trap in the canopy?

Challenges and Lessons Learned – Behind the scene

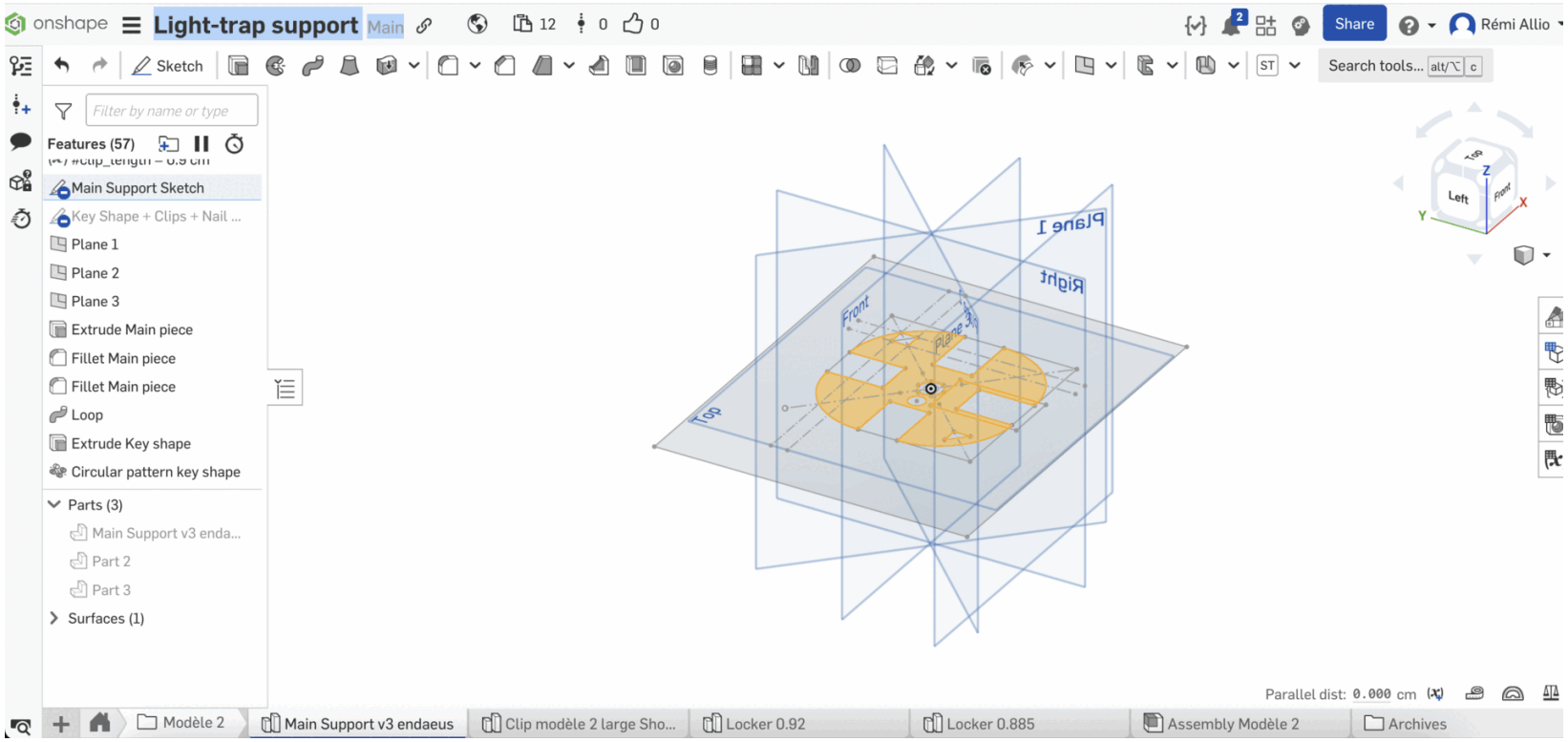
How can we avoid these constraints and make the installation process easier and faster?

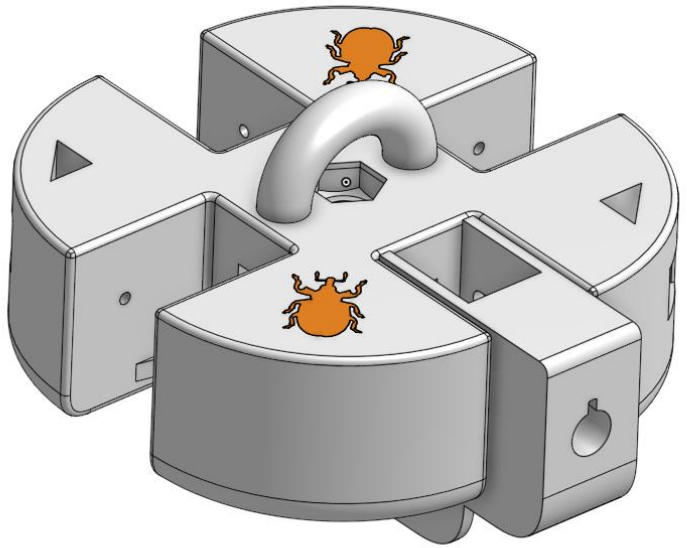
Challenges and Lessons Learned – Behind the scene

How can we avoid these constraints and make the installation process easier and faster?

Challenges and Lessons Learned – Behind the scene

onshape®





Challenges and Lessons Learned – Behind the scene

Challenges and Lessons Learned – Behind the scene

Demonstration…

Challenges and Lessons Learned – Behind the scene

How to bring the light trap in the canopy?

How to collect so many specimens while you are there?

More than 250 specimens for the targeted genus in ONE NIGHT

Challenges and Lessons Learned – Behind the scene

onshape®

What's next ?

What if we could film the timing and movement of weevils within their host plants?

BRITISH ECOLOGICAL SOCIETY | Methods in Ecology and Evolution

PRACTICAL TOOLS | Open Access

PICT: A low-cost, modular, open-source camera trap system to study plant–insect interactions

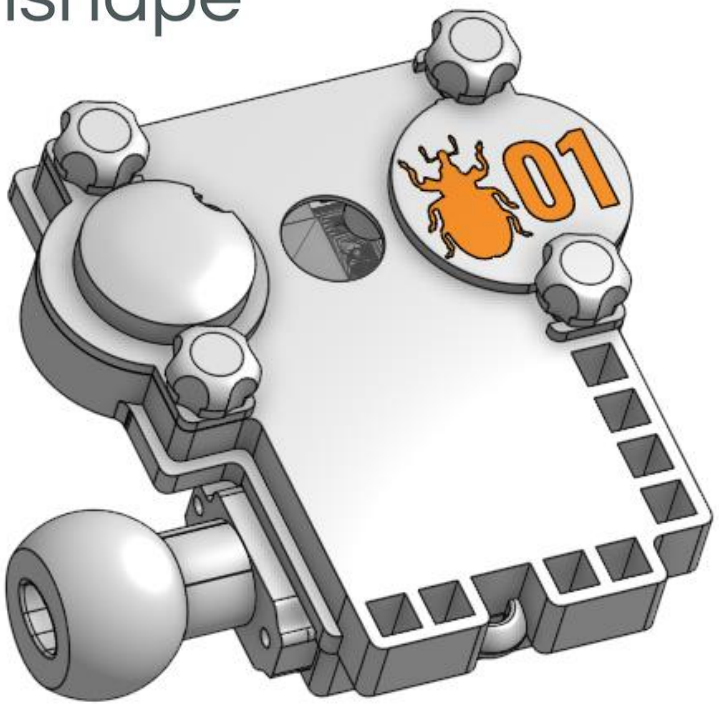
Vincent Droissart, Laura Azandi, Eric Rostand Onguene, Marie Savignac, Thomas B. Smith, Vincent Deblauwe

A great start, but not optimal for our purposes...

What's next ?

What if we could film the timing and movement of weevils within their host plants?

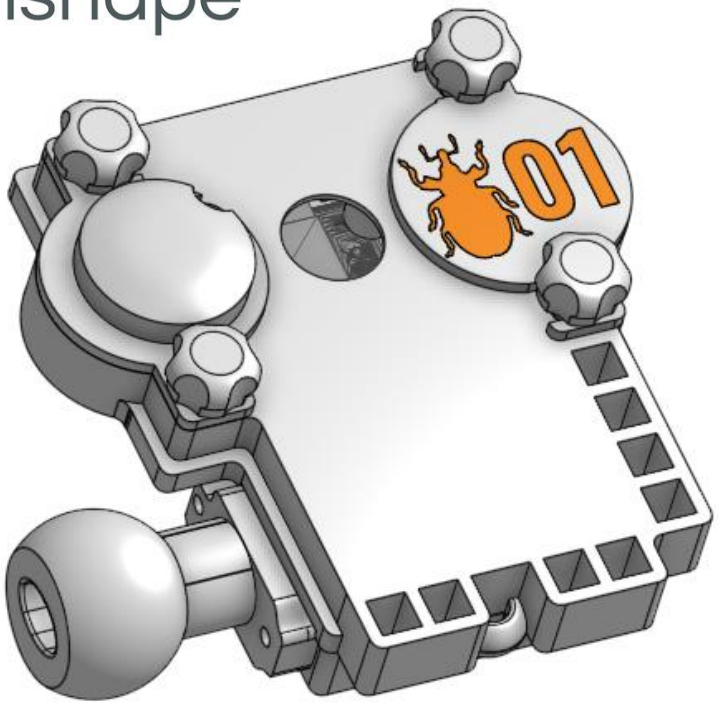
onshape®



What’s next ?

What if we could film the timing and movement of weevils within their host plants?

onshape®



What's n

What if **t plants?**

onsh


RPi Cam 2025.04.20_07:11:51
RPi Cam 2025.04.20_07:53:22
RPi Cam 2025.04.09_04:07:52


Thanks for listening!