



**HAL**  
open science

## Oophagous parasitoids are able to kill *Paysandisia archon* eggs (Burmeister, 1880) on Palm trees

Maurane Buradino, Bastien Cabrol, ETTY Colombel, Elisabeth Tabone

### ► To cite this version:

Maurane Buradino, Bastien Cabrol, ETTY Colombel, Elisabeth Tabone. Oophagous parasitoids are able to kill *Paysandisia archon* eggs (Burmeister, 1880) on Palm trees. Annual Meeting of the European Network of Palm Scientists (EUNOPS), May 2019, Paris, France. 2019. hal-02786342

**HAL Id: hal-02786342**

**<https://hal.inrae.fr/hal-02786342>**

Submitted on 4 Jun 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



# OOPHAGES PARASITOIDS are able to kill *Paysandisia archon* eggs (*Burmeister, 1880*) on Palm trees



Maurane Buradino, Bastien Cabrol, Ety Colombel and Elisabeth Tabone

INRA PACA- UEFM Laboratoire BioContrôle - Villa Thuret - 90 chemin Gustave Raymond  
06160 Antibes - France

## Introduction

*Paysandisia archon* (Lepidoptera, Castniidae) is an invasive insect from Argentina that attacks palm trees and is responsible for economic losses of millions of euros around the Mediterranean region. Palm Protect aims to find new treatments to control this pest that are less toxic to human health and the environment.

The Unity Entomology and Mediterranean Forest of the French Institute of Agronomy (INRA) has been evaluating whether egg parasitoids are able to parasitize *P. archon* eggs. The egg is the most accessible stage of development, attacking the egg would reduce damage caused by the endophytophagous larvae.

## Methods

Eggs of *P. archon* were exposed to different strains of *Trichogramma* in either tubes or in mesocosms (palms). Experiments were conducted under controlled conditions (temperature, humidity, day length).

In tubes eggs were incubated for 24 or 48 hours at a ratio of 1 egg to 5, 10, or 15 female parasitoids to determine the attractiveness of eggs to parasitoids and the impact of egg:female ratio.

In the mesocosm, 10 or 20 eggs were placed around the stipe of potted palms and exposed for 7 days to 1000 or 5000 *Trichogramma* to determine the attractiveness and ability of parasitoids to locate *P. archon* eggs.

At the end of the incubation periods eggs were assessed for parasitism and viability (abortion) and results are expressed as the global efficiency (parasitism + abortion) of *Trichogramma*.



## Results and discussion

### Screening in tubes

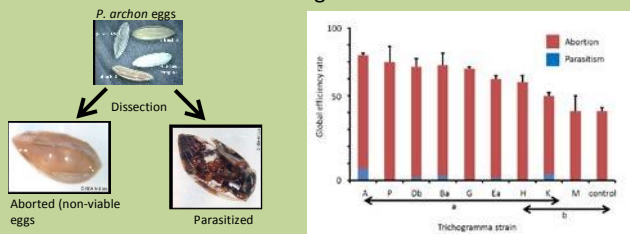


Figure 1. The global efficiency of *Trichogramma* in tubes

### Screening in mesocosms

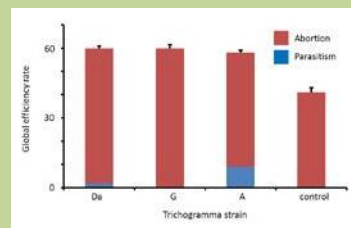


Figure 2. The global efficiency of *Trichogramma* released in mesocosms

Egg:Female parasitoid ratio does not affect parasitism rates.

In 100% of repetitions, a single *Trichogramma* female (strain P) is able to kill an egg of *P. archon*.

Five strains of *Trichogramma* parasitized *P. archon* eggs.

Abortion rate (63%) is significantly higher than natural abortion rate (41%).

Combined global efficiency rate (parasitism + abortion) = 74%.



Trichogramma female laying in *P. archon* egg.

Efficient strains in tubes gave good results in mesocosms.

Abortion rate after releases of *Trichogramma* (56%) is significantly higher than natural abortion rate (41%) (Figure 2).

The maximum global efficiency rate was 87% (Strain G)

The position of *P. archon* eggs in palm trees had no effect parasitism.

The larger number of *Trichogramma* released resulted in 10x more parasitism.

## Conclusions

*Trichogramma* are able to kill *P. archon* eggs.

Methods for *Trichogramma* strain selection is validated.

Position of eggs on palms did not affect parasitism : *Trichogramma* are able to explore the entire stipe.

*Trichogramma* could potentially be used for the biological control of *P. archon*, but the results have to be confirmed by releases *in-situ*.

This work has received funding from the European Community's Seventh Framework Programme under grant agreement No. FP7 KBBE 2011-5-289566 (PALM PROTECT)