# Tiny Wasps, Big Impact: The Potential of *Telenomus podisi* in Sustainably Managing Rice Stink Bugs

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# Rice Stink Bugs, Oebalus spp.

- Complex of 3 species
- Only insects requiring management in Florida rice
- Damage to developing rice grains: Attack during

0.2 mm

Figure 1. *Telenomus podisi*. Credit: E. Talamas.

The parasitoid, Telenomus podisi

early stages of grain development result in <u>yield loss</u> and during later stages, in <u>quality loss</u> ("pecky rice")



Figure 2. *Oebalus pugnax*. Credit: I. Loser.

Figure 3. *Oebalus insularis*. Credit: B. Woo. Figure 4. *Oebalus ypsilongriseus*. Credit: S. McCann.

- Parasitoids are natural enemies that will parasitize and kill the pest stage they attack, breaking the pest's cycle
- Attacks the egg stage of several species of stink bugs
- Naturally present in the Everglades Agricultural Area
- In other parts of the world: *T. podisi* is a commercial biological control product
  - Biological control: Interaction of a beneficial living agent and a pestilential organism, where the first acts in reducing the population of the second.

Current rice stink bug management relies on pyrethroid applications in conventional fields whereas rice stink bugs in organic fields are not managed.

**Research question:** Can the microwasp *Telenomus podisi* (1) be used as a commercial biological control product to manage rice stink bugs and (2) help increase agriculture sustainability in the region?

#### That's what we will be studying!

### **Biological control program**

<u>Past successful case in FL</u>: The microwasp *Cotesia flavipes* successfully controls the sugarcane borer

Steps for implementation:

- 1. Collection & species ID 🔗
- 2. Selection of host for rearing (?)
- 3. Biology & behavior studies ?
- 4. Dynamics of the pest in the field ?
- 5. Mass rearing and quality control ?
- 6. Release/Application methods (?)
- 7. Interaction with insecticides (?)



Figure 5 & 6. *T. podisi* leaving *Oebalus* egg masses. Credit: E. Talamas.



## **Biocontrol Agent**

- Reported to parasitize about 80% of rice stink bug eggs present in commercial rice fields
- Registered biocontrol product for Brazilian
   soybean against the brown stink bug
   (Euschistus heros)

# **Proposed Research Project**

- Three-year study (2025-2027)
- Laboratory and field studies
- Everglades REC & Commercial fields on the Everglades Agricultural Area (EAA)
  Biological control + Chemical control integration

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#### 8. Evaluation of cost-benefit ?

Completed in previous studies

? In development

#### Importance of the study for the rice industry and the EAA

- Rice stink bug management: Potential novel management strategy using biological control.
- Benefit to organic soils through rice: Reduction in soil insect pest activity, nutrient depletion, and subsidence.
- Sustainability in the EAA: Decrease in the use of broad-spectrum insecticides, expansion of organic production, and improvement in consumer perception of FL agriculture.

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