The panicle rice mite: identification, scouting and possible management options

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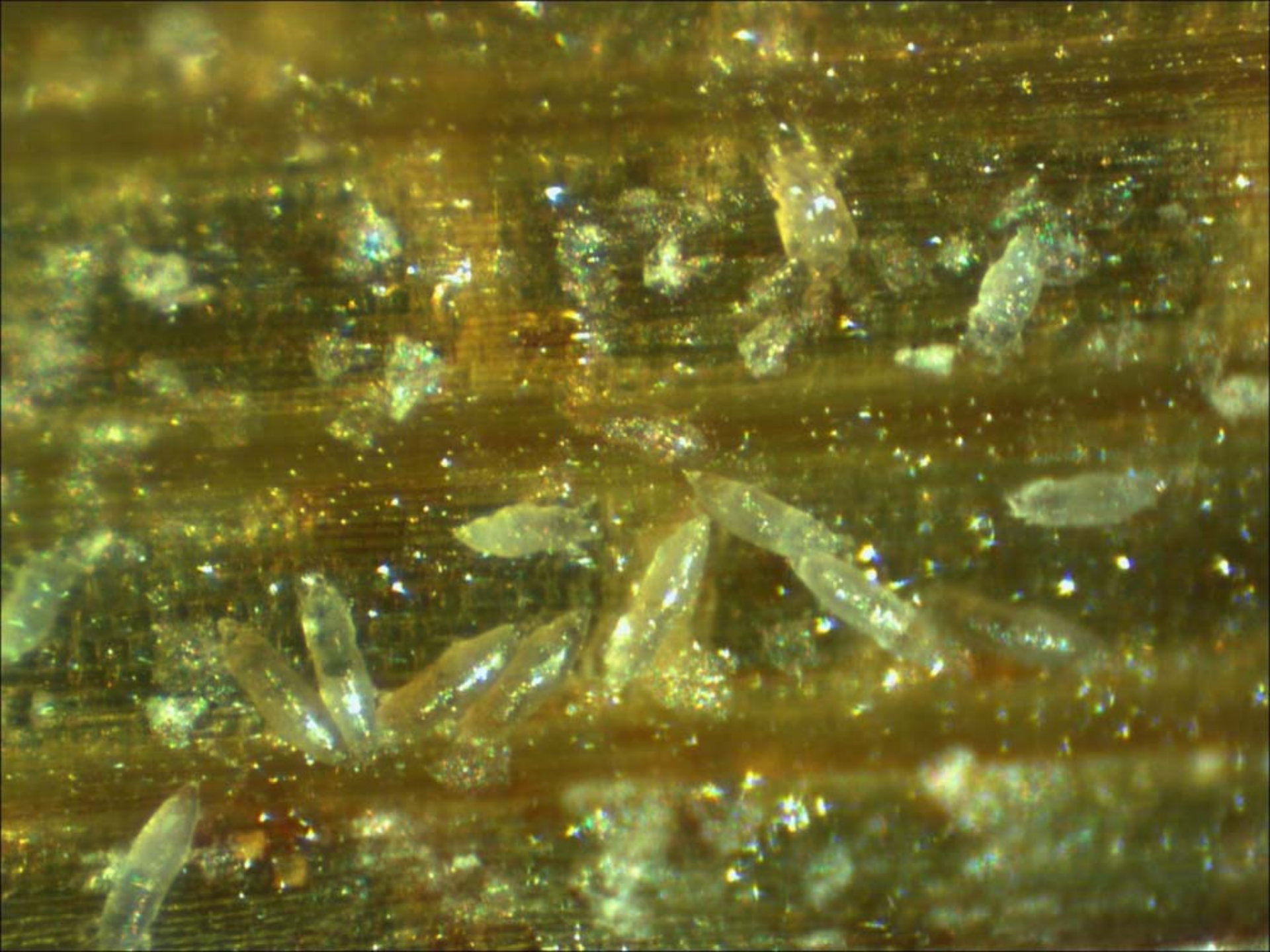
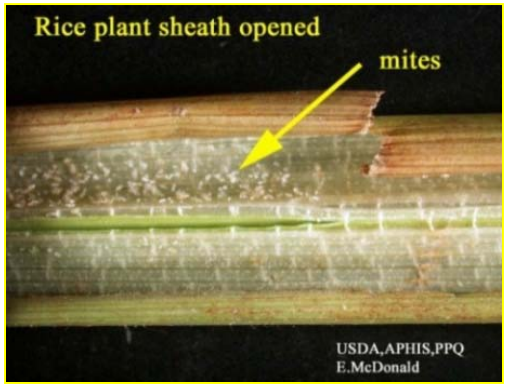


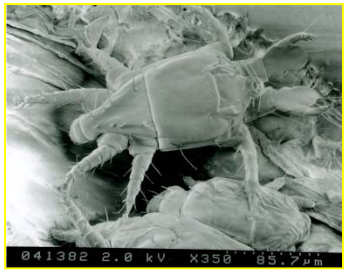
Identification and Biology

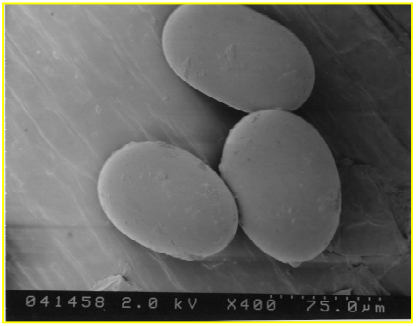
1. Tarsonemid mite
   - 1/100 inch long
2. Feed **inside** leaf sheath & on developing panicles
   - Grain sterility, blanks
3. Difficult to scout
   - Extremely small size
4. Many modes of dispersal
5. Regulatory response
   - No decisions have been made



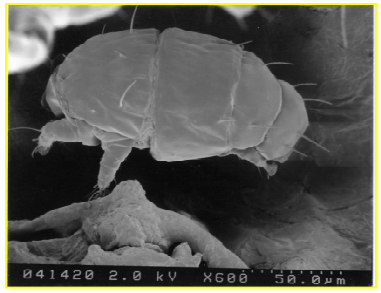
Panicle Rice Mite

Life Cycle





Eggs:
3 d at 77 °F



Larva:
2.2 d at 77 °F

Pupa:
2.5 d at 77 °F

3-21 days generation time
50-70 eggs/female

(Dossmann et al. 2005. El Aceituno)

(Pictures by E. Erbe USDA-ARS)

Phenology

- Seedling bed (Asia) → no mites
- Tillering → low density
- Flowering → density increases
- Milk → density continues to increase
- Grain maturing → decreasing density
- Second crop → higher densities from the beginning

(Lo and Hor 1977, Ou and Fang 1978, Lo and Ho 1980, Jiang 1994, Leyva et al. 2003, Ramos and Rodriguez 2001)

Overwintering

- Dominican Republic
  - Stubble
    - Volunteer regrowth
  - Broken stems
    - nitrogen and reflood for ratoon crop
    - residue carrying mites floats into water
  - Regrowth from seeds lost during harvest
  - Weeds on field margins

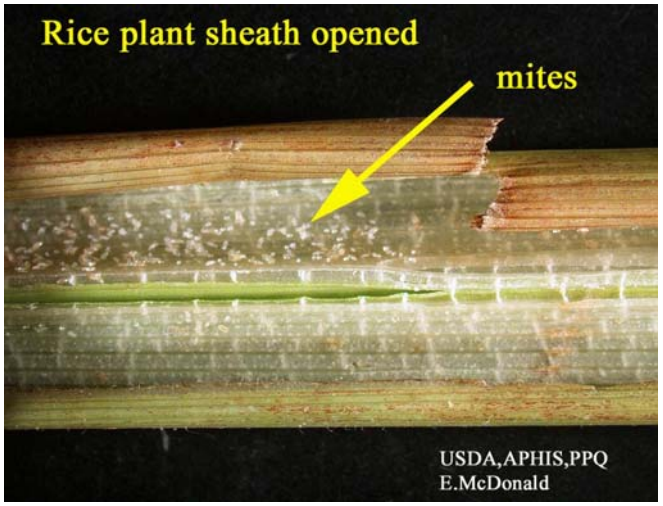
(Pellarano unpublished data)

Symptoms Associated with PRM

- Leaf sheath discoloration (sheath rot)
  - Chocolate-brown discoloration
  - Continues in new leafs
  - No distinct edge of lesion
- Bacterial panicle blight symptoms
  - Empty panicles
- Herbicide drift symptoms
  - Parrot-beaking
- Panicle Deformation

How to scout for mites: Look behind the leaf sheath

- View with 16X, 20X or 30X hand microscope



Diseases found in Louisiana that co-occurred with *S. spinki* in other countries

Bacterial panicle blight

Blast

Cercospora sheath rot

Curvilaria

Leaf scald

Pecky rice

Sheath Rot

Sheath Blight

Stackburn

(Pictures by Don Groth)

Management in infested countries

- Scouting early in the season
- Rotation of miticides
  - Seed treatments
- Resistant varieties of rice
- Fallow periods after harvest
  - Resting fields to break the cycle

(Navia et al. In Press)

Management in infested countries

- Destruction of crop residue
- Crop rotation
- Natural enemies
- Integrated management of
  - *Steneotarsonemus spinki* and *Sarocladium oryzae* complex
  - *Steneotarsonemus spinki* and *Burkholderia glumae* complex

(Navia et al. In Press)

Miticides used in infested countries

- India
  - Dimethoate 30EC, Curacron 50EC (Profenofos), Sulphur 80% WP, Dicofol, Monocrotophos, Acephate
- Caribbean & Central America
  - Abamectin, Biomite, Dicofol, Triazophos, Endosulfan, Ethoprophos, Seed treatment (Benomyl 5PM plus TMTD)
- Tropical threshold is 10 mites/plant

(Ghosh et al.1998, Navia et al. In Press, Cabrera et al. 1999 & 2002, Rao and Prakash 2006)

Possible Miticides in United States

Trade name	Active Ingredient
1. Zephyr	Abamectin
2. Agrimek	Abamectin
3. Avid	Abamectin
4. Kanemite 15 SC	Acequinocyl
5. Capture	Bifenthrin
6. Zeal	Etoxazole
7. Danitol	Fenpropathrin (pyrethroid)
8. Onager	Hexythiazox
9. Mesa/ultriflora	Milbimectin
10. GC Mite	organic product
11. Fujimite	Phenoxypyrazol
12. Curacron	Profenofos
13. Nexter	Pyridaben
14. Comite	Pyridaben

Biological control

- Predatory mites
  - Asia
    - *Amblyseius taiwanicus, Laisoseius parberlesei*
  - Cuba
    - *A. asetus, Galendromus sp., Typhlodromus sp., Lasioseius sp*.
  - Other countries
    - *Galendrominus alveolaris, Neoseiulus paraibensis, N. baraki, N. paspalivorus, Asca pineta, Aceodromus asternalis.*

(Lo & Ho, 1979, R. Ochoa Person Communication)

Biological control

Louisiana 2007

Hirsutella ?

- Fungal pathogens:
  - *Hirsutella nodulosa* Petch, 1926
  - Un-named internal parasite, round balls

(Wei and Zhou 1980, Navia et al. *In press*)

What should we do

- Educate ourselves about mite symptoms
  - County Agents, Consultants & Farmers
    - "Mite ID Workshops"

- Begin surveying for mite in fields
  - Winter meeting will train on sampling methods
- Begin evaluating miticides to control mites

Regulatory questions?

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