United States Department of Agriculture

Marketing and Regulatory Programs

Animal and Plant Health Inspection Service

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Detection & Identification of the Rice Mite *Steneotarsonemus spinki* Smiley (Acari: Tarsonemidae)

INTRODUCTION

The Rice Mite, *Steneotarsonemus spinki* Smiley, has been a recognized pest of rice throughout the rice-growing regions of Asia since the 1970s, and historical reports of crop damage dating back to the 1930s have also been attributed to the mite. Although the species was described from specimens collected from Louisiana in association with the planthopper species *Sogata orizicola* Muir (=*Tagosodes orizicolus* (Muir)) (Hemiptera: Delphacidae), there are no confirmed reports of this mite pest infesting US rice crops, and all attempts to re-collect the mite in Louisiana have failed. As such, the mite is not believed to occur in the US.

During the last decade, the Rice Mite has established itself in the Caribbean Region, including parts of Central America. It was first reported from Cuba in 1997 and in subsequent years was found in the Dominican Republic and Haiti. The first mainland reports of *S. spinki* for Central America occurred in 2003 from Panama, and it has since spread to Costa Rica (2004), Nicaragua, Honduras, and Guatemala (2005). Very low populations of the Rice Mite were also reported from Colombia in 2005, marking the first South American record.

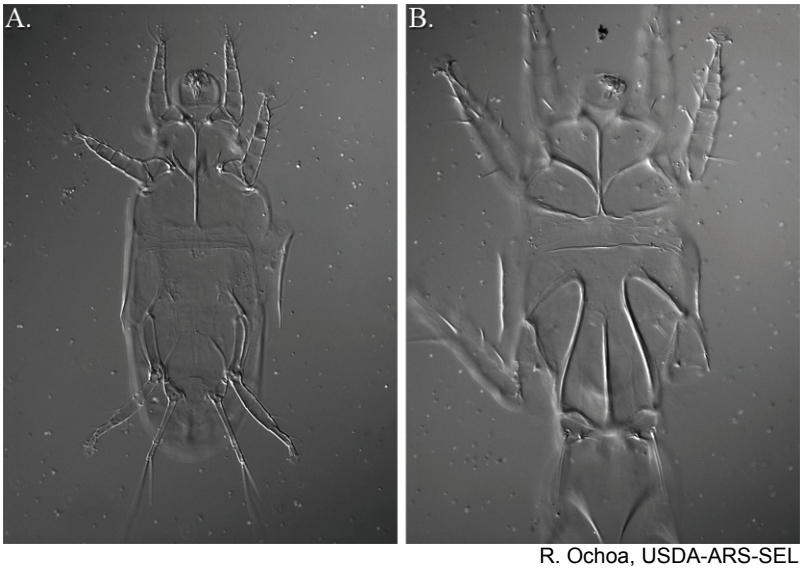

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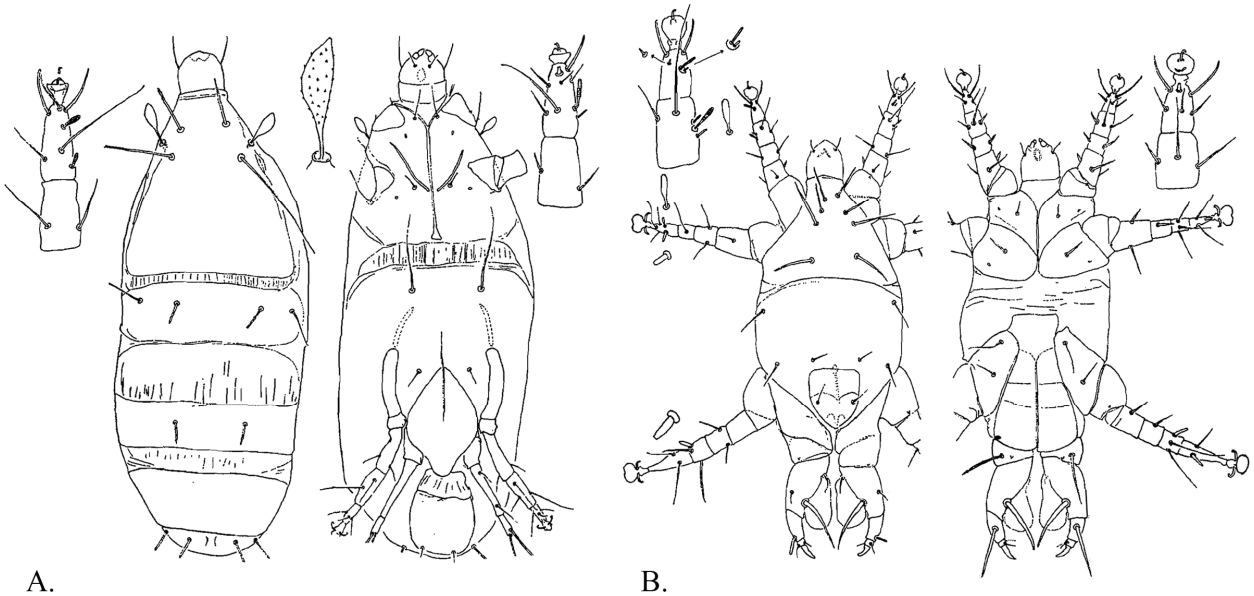
Figure 1. Light microscopy images of the Rice Mite, *Steneotarsonemus spinki*: A. Female ventral; B. Male ventral. Note: Images were not taken at the same scale.

PEST DESCRIPTION

S. spinki are small mites (~200-275μm) with an overall morphology that is clearly typical of the Tarsonemidae. Their color ranges from translucent to pale white and they may exhibit areas of darker, yellowish pigmentation depending on life-stage and/or feeding conditions. Males can be easily distinguished as they tend to be slightly smaller than females and possess highly modified hind-legs. While both sexes can be identified to the species level, males have very distinct characters that make then easier to identify and efforts should be made to collect them when possible.



A. B.

Figure 2. Illustrations of *Steneotarsonemus spinki* following Smiley 1967: A. Female; B. Male

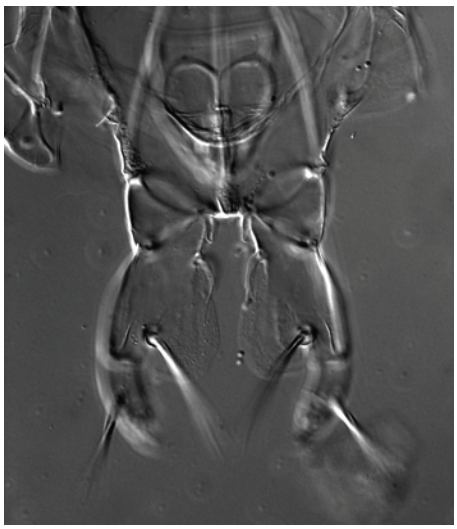


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Figure 3. Light microscopy image of Leg IV of the male Rice Mite, *Steneotarsonemus spinki*

HOST INFORMATION

Rice, *Oryza sativa* L., is considered to be the main host for *S. spinki*. However, recent studies in Central America have shown that the mite can complete its lifecycle on an additional plant species, *Oryza latifolia* Desv., an invasive species that occurs in rice fields.

Populations of the Rice Mite are typically found between the leaf sheath and the stem of the plant. As the rice grains develop, more mites can be found throughout the panicles, and reports suggest that the mites' feeding and reproductive activities reach their peak during the milky stage of grain development.

SYMPTOMS

The damage inflicted by Rice Mite feeding is typically concentrated on the reproductive structures of the plant and may include deformation of the inflorescences and panicles, as well as dehydration and necrosis of panicle tissues, including discoloration of the rice hulls. Sustained infestations can lead to declines in grain quality and panicle production, and in extreme situations sterility of the rice plants can occur.

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Figure 4. Typical panicle damage symptomatic of a Rice Mite infestation.

In addition to the damage caused by their feeding, the Rice Mite is often found in association with plant pathogens including phytopathogenic fungi: *Sarocladium oryzae* (Sawada), *Fusarium graminearum* Schwabe, *F. moniliforme* Sheldon, *Curvularia lunata* (Wakk.) Boed., *Alternaria padwickii* (Ganguly), as well as species in the genera *Pyricularia*, *Rhynchosporium*, and *Rhizoctonia*; bacteria: *Burkholderia glumae* (Kurita & Tabei); and spiroplasma: *Spiroplasma citri* Saglio. While the relationships between these pathogens and the mites is still not fully understood, there is speculation that the mites may serve as vectors of one or more of these pathogens. Although the impact of a suite of pests can be devastating, it is important to note that infestations of the mites alone have been responsible for reductions in rice productivity. Yield losses attributed to the Rice Mite range from 5% to 90%.

PATHWAYS OF CONCERN

Circumstantial evidence suggests that the Rice Mite can be spread through trafficking of rice seeds. In the US, the importation of rice and rice-related articles is regulated under 7 CFR 319.55 which prohibits the importation of seed or paddy rice from all foreign locations except the Republic of Mexico where it is allowed to enter under permit restrictions. As such, any rice seed or paddy rice imported under permit from the Republic of Mexico or under special research permits from Asia or the Greater Caribbean Basin should be carefully inspected for any signs of infestation.

While propagative material obviously presents the greatest risk for spreading the mites, thorough inspections should also be conducted of any imported by-products of rice-processing. Significant numbers of mites, representing various life stages, have been collected from the remnants of rice-crops. The importation of rice straw and rice hulls from all foreign locations is also restricted under 7 CFR 319.55.

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