

ACERIA SACCHARI, A NEW PEST MITE RECORDED ON SUGARCANE IN GUANGXI PROVINCE, CHINA

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Abstract

SUGARCANE IS ONE of the major agricultural industries in China with more than 60% of production in Guangxi province. Insect pests are considered the major constraints on sugarcane yield. In 2011, a new pest mite species was found on the sugarcane leaf sheath on the Sugarcane Research Institute farm at the Guangxi Academy of Agricultural Sciences. The mite was mainly present on the tender leaf sheath during the middle to later growth period. Dark red sponginess appeared on the inner leaf sheath at the peak of infestation with the exterior markedly distorted. White floccules were observed and the damaged area of the leaf sheath turned red-brown. The mite pest was found in Nanning and Baise cities, Guangxi provinces. In Nanning city, the incidence on variety ROC22 was 92.5% while on other sugarcane varieties it was low. In Baise city, the incidence on the same variety was between 65.7 and 98.0% and the pest was not recovered on other varieties. Based on morphological characteristics, the mite was identified as *Aceria sacchari* (Acari: Eriophyidae) (Channabasavanna, 1966). This species was first recorded on sugarcane in India, and was found to be widely distributed in that country. It has also been recorded in Australia, Philippines and Taiwan province of China. It is believed that the mite might have been introduced into mainland China from Taiwan province in the ROC22 germplasm and plantlets. This is the first report of *A. sacchari* as a pest on sugarcane in mainland China.

Introduction

In China sugarcane (*Saccharum officinarum* L.) is one of the main agricultural crops with more than 60% of the total cane yield produced in Guangxi province. Pests are considered to be the major factor reducing production.

A new pest mite was found on sugarcane leaf sheath on the farm of the Sugarcane Research Institute, Guangxi Academy of Agricultural Sciences in 2011. The pest mite on sugarcane was identified as *Aceria sacchari* (Acari: Eriophyidae) (Channabasavanna, 1966) based on morphological characteristics. To date, only thread-footed mite (Tarsonemid mite) has been reported causing damage on leaf sheaths of sugarcane (Zhang *et al.*, 2006).

Damage symptoms on sugarcane and morphological characteristics of the thread-footed mite are different from *Aceria sacchari*. This is the first report of *A. sacchari* (Acari: Eriophyidae) as a pest on sugarcane in mainland China.

Materials and methods

Symptoms caused by *A. sacchari* were observed with a 30× hand magnifier. The leaf sheath with symptoms was cut off and dipped into a little glass bottle with 75% ethanol-sucrose saturated solution when *A. sacchari* was found.

The leaf sheath was taken off after 1–2 d. The sample was marked with the date recorded, where it was collected, colour of the mite, life style, symptoms etc., and brought back to laboratory for making a temporary slide and observed. Classification of the mite was based on the method of Amrine *et al.* (2003).

Symptom and distribution

In 1966, *A. sacchari* was firstly found on the leaf sheath of sugarcane by Channabasavanna in India. The mite is mainly distributed in India, Australia, Philippines and Taiwan province of China. Up to date, the mite has only been found in Nanning and Baise cities of Guangxi province, mainland of China.

The occurrence rate on sugarcane variety ROC22 was 92.5% in Nanning city, and it occurred sporadically on other varieties bred by the Sugarcane Research Institute, Guangxi Academy Sciences. Only variety ROC22 was found to be damaged with the rate 65.7–98.0% in Baise city.

The mite harmed the inner leaf sheath, appeared deep-red, had a spongy erineum in the peak period of occurrence, and had an outward protuberance. During the later period of occurrence, the damaged surface appeared to be white cottony or woolly. The part of the leaf sheath turned to brown-red and died, resulting in inhibition of water and nutrition transport, but the growth of the sugarcane plant was not affected markedly (Figure 1).

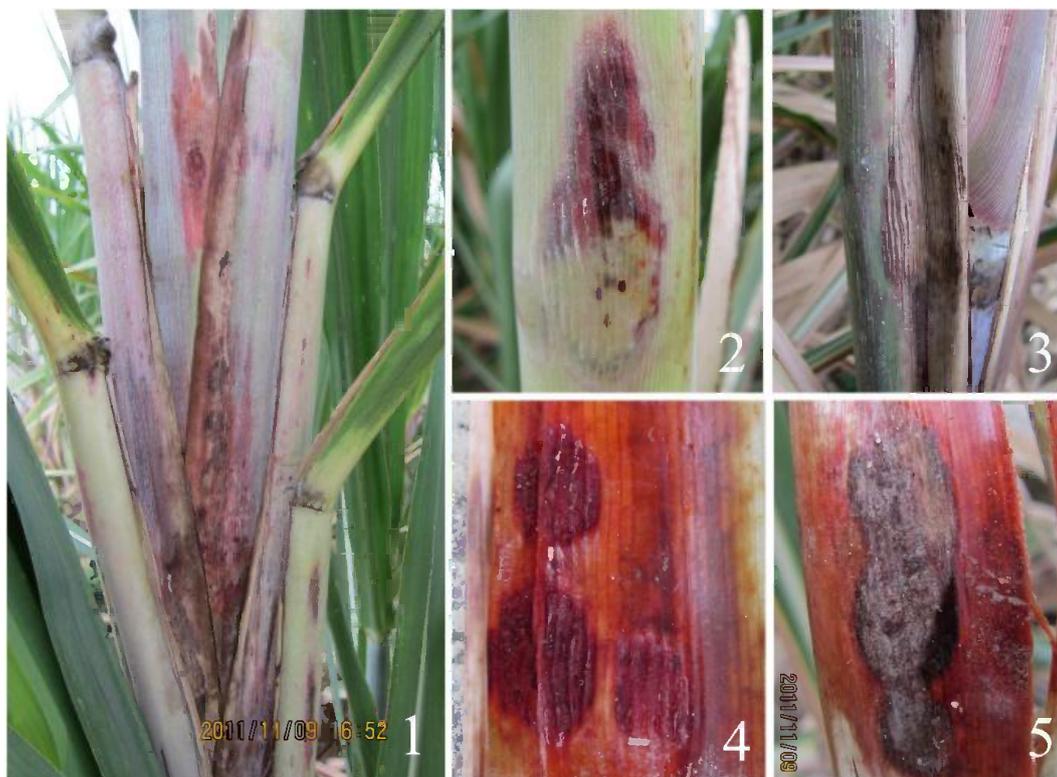


Fig. 1—The symptoms caused by *A. sacchari* on the leaf sheath of sugarcane. 1. severe symptoms, 2. symptom on young leaf sheath, 3. symptom on old leaf sheath, 4. symptom of inner leaf sheath during the peak period, 5. symptom of inner leaf sheath during the late period).

Morphological characteristics

Adult *A. sacchari* are worm shaped, elongated (180–260 μm), thick (30–60 μm), and a white colour. The dorsal shield plate has an anterior shield lobe, the dorsal line is imperfect, side line and subcentral line are perfect, but the subcentral line has an intermittent shape with dorsal tubercles, dorsal setae grow backward. Coxae have short line decoration, coxa with 3 pairs of seta.

Each podomere is normal, legs with model seta, feather claw 6 branches, claw with terminal bulb. The back is bow-shape, the ring on the back and abdomen are similar with 78–82 rings, long microtubercle, seta on abdomen are perfect with sub-seta. Genital coverflap of female has 8–12 longitudinal ridges (Figure 2).

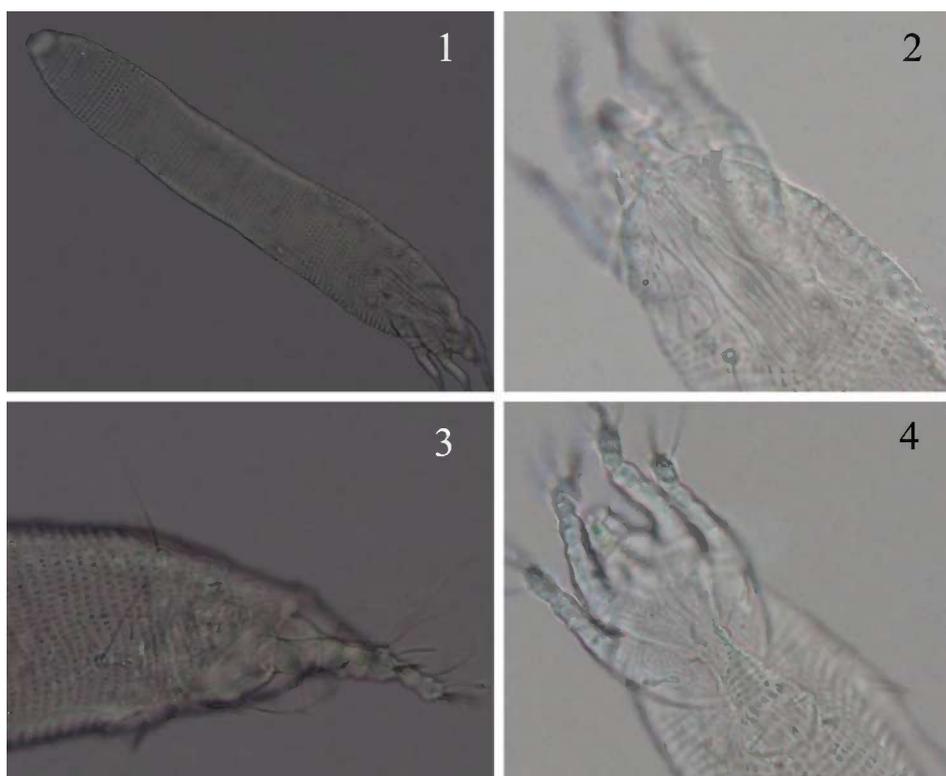


Fig. 2—Morphological characteristics of *Aceria sacchari*.
1. dorsal view of female; 2. dorsal shield plate; 3. lateral view of female; 4. Genital region on coxa).

Control measure

Aceria sacchari are distributed in India, Australia, Philippines and Taiwan province of China. ROC22 is the main sugarcane variety cultivated in Guangxi province. It needs to be confirmed that the mite might have been introduced into mainland China with ROC22 from Taiwan province.

To date, the biological information is unclear. Relevant control measures need to be considered owing to the fact that the mite can severely damage sugarcane and result in substantial loss in yield.

Inspection and quarantine

Aceria sacchari occurred originally abroad and no report has shown that the mite can cause damage on sugarcane in mainland China. Because the mite is minute and lethargic, it disperses only a short distance by itself. Introduction and transport of sugarcane seed cane is the main mode of long distance dispersal.

Therefore, inspection and quarantine is a critical way to restrict this mite from spreading. Sugarcane seed cane from an area with mite infestations need to have the leaf material removed and treatment with an acaricide.

Control method

Because the mite damages the leaf sheath of sugarcane, insecticides cannot reach the insect; therefore, chemical control is not recommended. It is recommended that healthy seed cane is selected for cultivation. The sugarcane seed cane infested with the mite should be hot water treated at 52 °C for 20–30 min, preferably with the addition of an acaricide. Sugarcane trash should be removed and fumigated or removed after harvesting to reduce possible spread. The mite only damages sugarcane, therefore crop rotation could reduce infestations.

Acknowledgements

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