

## Occurrence of *Stigmaeopsis nanjingensis* in Europe

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### Abstract

The occurrence of the Asiatic mite *Stigmaeopsis nanjingensis* (Ma et Yuan) (Acari Tetranychidae) in Europe (Italy) is here reported. The mites live on the underside of bamboo leaves (*Phyllostachys* sp. and *Pseudosasa* sp.), protected under web nests, and are recognizable by the presence of whitish spots on the upper side of leaves.

**Key words:** bamboo mite, Acari, Tetranychidae, *Phyllostachys*, Italy.

### Introduction

A survey on pests of ornamentals carried out in the historical Botanical Garden of Padua (Veneto region, Italy) during 2007, led to the detection of established alien insects and mites. Among them, several species were discovered on bamboos. Bamboos were planted in the Botanic Garden of Padua in the second half of the nineteenth century and, according to the Curator of the Botanic Garden, no further introductions of bamboo plants have occurred since. The origin of plant material is certainly eastern Asia but the country involved is unknown.

Besides oriental species such as *Kuwanaspis pseudoleucaspis* (Kuwana) (Hemiptera Diaspididae), *Takecallis arundinariae* (Essig), *Takecallis taiwanus* (Takahashi) (Hemiptera Aphidoidea), *Cerodontha unisetiorbita* (Zlobin) (Diptera Agromyzidae), already recorded on bamboos in Italy (Lupo, 1938; Limonta, 1990; Süss, 2001), the most interesting findings regarded a new species of mealybug, *Balanococcus kwoni* Pellizzari et Danzig (Hemiptera Pseudococcidae), recently described (Pellizzari and Danzig, 2007), a new species of Eriophyid mite, belonging to the genus *Jaranasia* (De Lillo, pers. comm.) and a tetranychid mite, provisionally identified as belonging to the *Stigmaeopsis celarius* complex. Mites were collected off *Phyllostachys mitis* (A. et C. Rivière), *P. nigra* (Lodd.) Munro, and, to a less extent, off *Pseudosasa japonica* (Siebold et Zucc.). Symptoms on leaves consisted in whitish round and oval spots on the upper surface. Mites were detected on the leaf undersurface, protected under a dense web nest. With the extent to know how much this species was widespread in the Veneto region, a survey on *Phyllostachys* bamboos, in parks and private gardens in different localities, was carried out during summer 2007 and 2008. Symptoms of mite infestation and mite colonies were found in several surveyed sites. Mites were also collected on *Phyllostachys* bamboos growing in northwestern Italy, Liguria region. Specimens from different localities were sent to Japanese specialists to confirm their identity and all specimens proved to be *Stigmaeopsis nanjingensis* (Ma et Yuan) (Acari Tetranychidae). According to the Spider Mites Web (Migeon and Dorkeld, 2009) this species is not yet reported for Europe.

So far, in Europe, two species of alien tetranychid mites have been recorded on bamboos, namely *Stigmaeopsis celarius* Banks in The Netherlands, Great Britain, Belgium and France, and *Schizotetranychus bambusae* Reck in France only (Vierbergen, 1997; Ostoja-Starzewski, 2000; Auger and Migeon, 2007). *S. celarius* is also widespread in the USA.

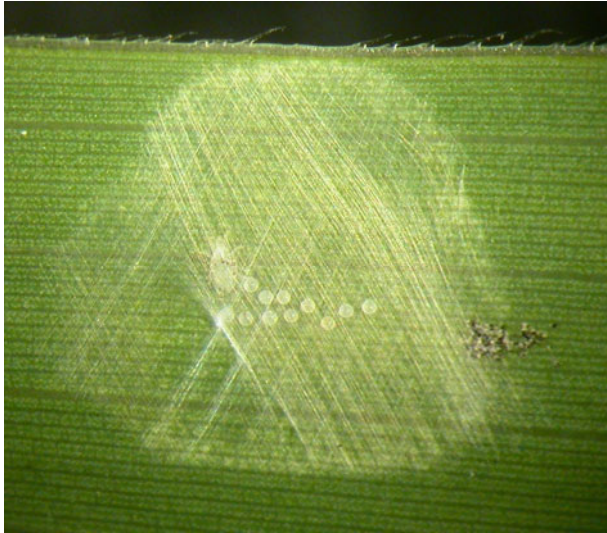
Presently, the *S. celarius* complex consists of seven species: *S. celarius*, *S. nanjingensis*, *S. longus* (Saito), *S. miscanthi* (Saito), (the last two previously known as *celarius* in Japan), *S. tenuinidis* (Zhang et Zhang), *S. saharai* Saito et Mori and *S. takahashi* Saito et Mori, (Saito *et al.*, 2004). Of these, only *S. miscanthi* inhabits plants other than bamboo.

### Biological notes

*S. nanjingensis* is a nest-weaving species, as other social mites belonging to the *S. celarius* complex. According to Zhang *et al.* (2001) overwintering is carried out by adult females. Nests are spun by a fundatrix female on the underside of new bamboo leaves (figure 1). Females start to lay eggs in late February, and in April the new generation establishes web nests on the new leaves. Juveniles feed and develop within the nest. Nest sanitation is ensured by defecation on one side of the nest, near one entrance. During summer months, with high temperatures, the mite population decreases and enters aestivation. Later, there is a new population peak from late summer to November. Nests by *S. nanjingensis* are usually spun on new leaves (Zhang *et al.*, 1999). Often a nest is connected with others, so that on the upper surface there is a row of whitish-yellow spots (figure 2).

### Economic importance

Among mites feeding on bamboos, *S. nanjingensis* is credited as the most serious pest of *Phyllostachys pubescens* Mazel ex Houz. (Giant or Moso bamboo) plantations in China since 1986, when, in response to an increasing demand, natural bamboo forests in Fujian were changed into artificial monocultures to increase production (Zhang *et al.*, 2003). Over there, Moso bamboos have a noticeable major economic importance as mate-



**Figure 1.** Nest of *S. nanjingensis* spinned on the underside of a leaf. Under the spin roofing a female with eggs. Notice the defecation site on one side of the nest. (In colour at [www.bulletinofinsectology.org](http://www.bulletinofinsectology.org))



**Figure 2.** Damage by *S. nanjingensis* on bamboo leaf. (In colour at [www.bulletinofinsectology.org](http://www.bulletinofinsectology.org))

rial for furniture, scaffolding, etc. Mite feeding by *S. nanjingensis* reduces sugar and chlorophyll content in bamboo leaves; moreover it reduces leaf areas, and culms become thinner and longer (Zhang *et al.*, 2000). As mite feeding goes on, leaves become yellow and brown, and then fall. This is a severe damage because Moso bamboos change their leaves every two years. Monoculture, crowding of bamboo and removal of ground vegetation are regarded as major causes of the outbreaks (Zhang *et al.*, 1999a; 2004).

The predatory mite *Typhlodromus bambusae* Ehara (Phytoseiidae) is a specific natural enemy of *S. nanjingensis* and the major responsible of biological control of this mite in poly-cultured Moso bamboo forests (Zhang *et al.*, 1999a). Its success is due to its capability to enter in the webnests of its prey.

In Europe, bamboos are cultivated only for ornamental purposes. Damaged leaves persist on the plants and are detrimental for their aesthetic value.

## Distribution in Italy

Presently *S. nanjingensis* is widespread in the Veneto Region (North-Eastern Italy) on ornamental bamboos (*Phyllostachys mitis*, *P. nigra* and, to a less extent, *Pseudosasa japonica*). Infestations were observed in Padua, Treviso and Vicenza districts, both in new and old plantations of historical parks. Moreover it has been recorded also in the Liguria region (North-western Italy), at Ventimiglia (Imperia district), near the French border. The infested plants are easily recognizable by the whitish-yellow spots on the upper side of leaves. Further investigations are needed to define the actual distribution of this species in Europe.

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