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An Asian Woolly Hackberry Aphid, *Shivaphis celti* Das (Homoptera: Aphididae)[1]

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INTRODUCTION: An Asian woolly hackberry aphid, *Shivaphis celti* Das (Fig. 1), was found for the first time in Florida in Jacksonville, Duval County, on sugarberry (*Celtis laevigata* Willd.) on 13 August 1997 by Florida Department of Agriculture & Consumer Services' Division of Plant Industry Plant Inspector Flewellyn W. Podris. Since then, these Asian woolly hackberry aphids have been collected in counties spanning most of Florida. *Shivaphis celti* was found in Georgia about a year before its discovery in Florida.

There are several species of Asian woolly hackberry aphids. The East and Central Asian genus *Shivaphis* contains six described species, of which four are in *Shivaphis sensu stricto*, and the other two are in the subgenus *Shivaphis* (*Sinishivaphis*) (Quednau and Remaudière 1985; Remaudière and Remaudière 1997; Zhang and Zhong 1982). They are found primarily on *Celtis* spp., with one described species, *Shivaphis* (*Sinishivaphis*) *tilisucta* Zhang, from China on *Tilia* (Zhang and Zhong 1990). Two more species, included in *Shivaphis* in older literature, are now in the genus *Neocranaphis* (Remaudière and Remaudière 1997). These species infest bamboo and closely related plants. No Asian woolly hackberry aphids other than *S. celti* are known to occur in the Western Hemisphere.

Figure 2. *Shivaphis celti* Das colony on *celtis*. Note copious quantities of bluish white wax around the insects. Photography credit: P.M. Choate.

Figure 1. Winged adult female *Shivaphis celti* Das on hackberry. Photography credit: P.M. Choate.

DESCRIPTION: *Shivaphis celti* is conspicuous because the aphids secrete copious quantities of bluish white wax (Fig. 2). The aphids are small, about 2 - 2.5 mm long. As is often the case with Myzocallidini, the anal plate is deeply cleft. The cauda is finger-like rather than constricted into a knob. There are conspicuous wax glands on the abdomen. Siphunculi are pore-like, on slightly raised cones. Wing veins are bordered, particularly at the distal ends. Antennal joints are darkened, giving the antenna a striped appearance. The processus terminalis is rather short, about three times as long as wide. These characters will separate *S. celti* from other genera of aphids on *Celtis*, and from other Asian woolly hackberry aphids (Blackman and Eastop 1994; Quednau and Remaudière 1985).

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HOSTS: *Shivaphis celti* probably is restricted to *Celtis*, although Chakrabarti (1988) found *S. celti* occasionally on *Arundo donax* L. Host species of *Celtis* include: *C. australis* L., lote-tree, Mediterranean hackberry (Chakrabarti 1988; Raychaudhuri *et al.* 1980); *C. jessonensis* Koidz, Korean hackberry/ezo-enoki (Quednau, 1979); *C. laevigata* (Florida observations); *C. nervosa* Hemsl., little leaf hackberry (Chinese common name) (Zhang and Zhong 1983); *C. sinensis* Pers., Japanese hackberry (Higuchi 1972; Zhang and Zhong 1983); *C. tetrandra* Roxb., Malayan hackberry, (Chakrabarti 1988); and *C. tetraneura* [sic] (Raychaudhuri *et al.* 1980). Other hackberry species listed only by Chinese common name include: green hackberry, sand or desert hackberry, Yunnan hackberry, American hackberry and Australian hackberry (Zhang and Zhong 1983).

SURVEY AND DETECTION: Look for small (up to 2 mm) balls of fuzzy wax on the backs of hackberry leaves (Fig. 2). Infestations can be found in both urban and natural landscape situations.

LIFE HISTORY: Summer adults are all female and parthenogenetic. Summer adults may be winged or wingless. In the autumn (October in Gainesville), winged males and wingless oviparae can be found. These mate to produce an overwintering egg that allows the aphids to survive the winter when there are no leaves on the trees. Raychaudhuri *et al.* (1981) described the oviparous forms.

CHEMICAL CONTROL: No long-term damage associated with woolly hackberry aphids has been observed; however, aphids may become quite numerous on some trees in late summer. Chemical treatment probably is not warranted for protecting the health of the infested trees.

BIOLOGICAL CONTROL: Two aphid parasitoids were described from *S. celti*, including *Trioxys* (*Trioxys*) *soporensis* Shujauddin (Shujauddin 1982) and *Trioxys* (*Binodoxys*) *jaii* Bhagat (Bhagat 1982). Another parasitoid, *Trioxys* (*Trioxys*) *shivaphis* Takada, is mentioned in Shujauddin (1982). The efficacy of these parasitoids in controlling the population is not known. No parasitized *S. celti* have been found in Florida so far.

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