

# Dr Jekyll and Mr Hyde – recently introduced pathogens of invasive flora may threaten endangered native species

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Tomato Red Spider Mite on native Kangaroo Apple *Solanum aviculare*. Photo: Peter Ridgeway. [Tomato Red Spider Mite 1.jpg]

Asian Woolly Hackberry Aphid *Shivaphis celti* on Chinese Celtis *Celtis sinensis*. Photo: Alex Burgess-Buxton [image005.jpg]

## Summary

In the last 12 months two pest species were accidentally introduced to Greater Sydney. Both pests are likely to impact native as well as exotic species, raising interesting questions on biosecurity and the management of accidental biocontrol.

## Tomato Red Spider Mite

Tomato Red Spider Mite (*Tetranychus evansi*) is small sap-sucking mite generally found on plants in the Solanaceae family. It was first detected in Australia on the herbaceous weed *Solanum nigrum* at Port Botany by the then Australian Government Department of Agriculture, Fisheries and Forestry Operational Science Program in August 2013 and subsequently at Rosebery, Sydney Airport, Rockdale, Darlington, Alexandria, Kurnell, Homebush and Merrylands (Biosecurity SA 2013) and independently at Lane Cove (Kearney & Kearney 2014).

Tomato Red Spider Mite is superficially similar to a number of other species including the widely established exotic two-spotted spider mite (*Tetranychus telarius* sp. agg.). Microscopic identification is recommended for which a key is available online (Seeman & Beard 2005). The mite has been recorded overseas on numerous *Solanum* species including the exotic plant pest Blackberry Nightshade *Solanum nigrum*, as well as other plant pests including Couch (*Cynodon dactylon*), Lantana (*Lantana camara*) and Caster Oil Plant (*Ricinus communis*).

In Australia the species has been recorded on exotic Glossy Nightshade (*Solanum americanum*; Kearney & Kearney 2014), exotic Blackberry Nightshade (*Solanum nigrum*; Biosecurity SA 2013) and native Kangaroo Apple (*Solanum aviculare*; Kearney & Kearney 2014, Ridgeway *pers. obs.*). Other potential native hosts include *Solanum* spp., orchids, and *Galium* spp. (Migeon & Dorkeld 2013).

At Lane Cove, scattered individuals of Tomato Red Spider Mite rapidly progress to dense orange infestations comprising thousands of individuals with visible webbing. Mites are mobile and have been observed to disperse by wind, native fauna and on clothing. One population of native Kangaroo Apple reported by Kearney & Kearney (2014) in January this year had experienced 50 per cent mortality when revisited in August, with all plants exhibiting some level of mite damage (Ridgeway *pers. obs.*).

Conversely the mite has impacted the environmental weed Glossy Nightshade at this site. The impact of the recently arrived mite on native and exotic flora is yet to be seen.

There is serious potential for this mite to impact two threatened *Solanum* spp., endangered under NSW law, in the Greater Sydney region. The shrub *Solanum armourense* is restricted to a small number of individuals in four colonies between Mt Armour and Wombeyan in the southern Blue Mountains. The shrub *Solanum celatum* is similarly restricted to a small number of individuals between Wollongong, Nowra and Bungonia south of Sydney. Given the extremely low population sizes of these endangered species, the potential impact of Tomato Red Spider Mite is of concern.

### **Asian Woolly Hackberry Aphid**

The Asian Woolly Hackberry Aphid (*Shivaphis celti*) was first detected in Australia in September 2013 on blackberry plants from China, and subsequently in the wild at Mascot and Camperdown. A national meeting of the Consultative Committee on Emergency Plant Pests determined that the pest was not an emergency plant pest and that therefore no further action would occur. The species is a known parasite on *Celtis* species.

Chinese *Celtis* (*Celtis sinensis*) is an exotic tree and declared Class 4 weed (under the NSW *Noxious Weeds Act 1993*) in most of the Hawkesbury-Nepean region. In Greater Sydney the species is semi-deciduous from mid- to late-winter to Spring. In March 2014 the Asian Woolly Hackberry Aphid was observed to be significantly impacting Chinese *Celtis* along the Hawkesbury-Nepean River and its tributaries between Richmond and Camden and along the Parramatta River (Burgess-Buxton *pers. obs.*). Aphids caused complete defoliation of immature Chinese *Celtis* up to about 1.5 metres in height and significant defoliation to mature specimens. This impact has in some cases been confused with annual deciduous activity. It is not yet clear how effective this pest will be as an accidental biocontrol of this invasive plant.

In the Greater Sydney region the Native *Celtis* (*Celtis paniculata*) is present in coastal suburbs and in some patches of Western Sydney Dry Rainforest. There is cause for concern

that the Asian Woolly Hackberry Aphid may have detrimental impact on this species. Greater awareness of this selective pest by the conservation and bush regeneration community would be merited.

### **Recommendations**

Both the Tomato Red Spider Mite and the Asian Woolly Hackberry Aphid are already established in the wild and may be difficult or impossible to contain given their modes of dispersal. Nonetheless there is clearly merit in further dissemination of advice to conservation land managers regarding these species and their potential impacts. An article is currently under preparation for the newsletter of the Australian Association of Bush Regenerators to this purpose.

The NSW Wildlife Atlas (BioNET) maintained by the NSW Office of Environment and Heritage has not registered these species. Registration would encourage submission of records and assist in tracking distribution and establishment of these pests over time.

Immediate concern should be targeted to the potential impact of Tomato Red Spider Mite on endangered *Solanum* species in the Greater Sydney region. Field operators in the southern Greater Blue Mountains World Heritage Area should be informed of the species and encouraged to report potential outbreaks to the NSW Department of Primary Industries. Development of a fact sheet would assist with this purpose. Travel between infected areas and identified high risk sites should be avoided. Field staff should be encouraged to look out for isolated individuals before dense masses develop. There are presently no chemicals registered for control of either pest on native flora, however Tomato Red Spider Mite can be effectively contained by burial under black plastic.

The threat of Tomato Red Spider Mite should be identified as a threat in recovery planning for *Solanum armourense* and *Solanum celatum*. Both species are considered data deficient and research programs should address this new threat and potential management responses as a priority.

### **References**

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