# Sycamore tree lace bug (*Corythucha ciliata* Say) (Hemiptera: Tingidae) reaches Africa

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In February 2014 colonies of a large and conspicuous lace bug (Fig. 1A) were collected from the undersides of the leaves of London plane trees (*Platanus* × *acerifolia*) in the suburb of Newlands, Cape Town, South Africa. Infected leaves could easily be identified by their characteristic bronzed appearance (Fig. 1B). The lace bugs were subsequently identified as *Corythucha ciliata* (Say) using keys to North American *Corythucha* species (Mead 1989) and economically important tingids of the world (Stonedahl *et al.* 1992). *Corythucha* species have high host-specificity, whilst *C. ciliata* is the only lace bug known to feed on *Platanus* species (sycamores) – this association is thus considered to be diagnostic for the species (CABI 2014). *C. ciliata* has a broad native range across the eastern parts of North America and Canada, where it is largely monophagous on *Platanus* (sycamore) trees, with *P. occidentalis* being its main host. However, it also occurs on *Platanus* hybrids, and in invasive parts of its range feeds on *P. orientalis* and *P.* × *acerifolia* (the hybrid between *P. occidentalis* and *P. orientalis* (CABI 1984). In addition to *Platanus* hosts, it has also been recorded from paper mulberry (*Broussonetia papyrifera)*, Hickory (*Carya)* and Ash (*Fraxinus*) (Öszi *et al*. 2005).

This is the first recorded occurrence of *C. ciliata* in Africa (see CABI 2014 for current native and invasive range), and it has now been reported on all continents save Antarctica. The bug is highly invasive, and after being recorded from Italy in 1964 spread across Europe, reaching Asia after approximately 40 years (CABI 2014). It was recorded from South America (Chile) in 1990, and Australia (New South Wales) in 2006 (CABI 2014). The majority of its invasion events are fairly recent, suggesting that *C. ciliata* may also be a recent invader in South Africa, rather than having established much earlier and evaded detection until now.

To assess the prevalence and spread of *C. ciliata*, 20 London plane trees were sampled for *Corythucha* at each of 11 sites in the Western Cape Province, South Africa: at one of these sites (Cape Peninsula) the bugs were sampled at a further eight sub-sites. The bugs were absent from young trees (bole circumference less than *c.* 0.60 m and height less than 5 m), which lacked the flaking bark required for adult winter hibernation sites (Özsi *et al.* 2005), and may thus be protected from colonization. *Corythucha* was present at 10 of the 11 sites inspected (Fig. 2). At the sites where the bugs were present, most trees (mean % prevalence = 88.79, S.D. = 17) were infested. Currently the known range of *C. ciliata* is restricted to the Western Cape Province, extending 220 km to the east of Cape Town. This is likely an artefact of our search effort, as the bugs were found at nearly all of the surveyed sites. *C. ciliata* was absent from only two surveyed sites. The first was a high-altitude, very isolated site at Beaverlac, in the Groot Winterhoek mountains, surrounded by natural vegetation and remote from other plane tree populations (Fig. 2). Lace bugs were also absent from two exposed coastal sub-sites (Camps Bay and Sea Point) on the western seaboard of the Cape Peninsula. The latter sites are subject to high temperatures and strong desiccating winds in summer and this may be the reason *C. ciliata* has failed to establish there. The plane trees at these sites were also relatively small and stunted. Plane trees are widely used in parks, streets and domestic gardens in the more temperate parts of South Africa. It is thus likely that wider sampling will increase the known range of *C. ciliata* in South Africa, especially since it has very wide temperature tolerances of –30 °C to 38 °C (Gillespie 2007). Although adults are winged, dispersal is thought to take place from bugs that have fallen from trees onto vehicles parked beneath, which then transport them along major routes, which are frequently lined with avenues of plane trees (CABI 2014). Given the fragile nature of the bugs, the most likely mode of introduction to the Western Cape Province is through imported merchandise in which hibernating adults would be able to

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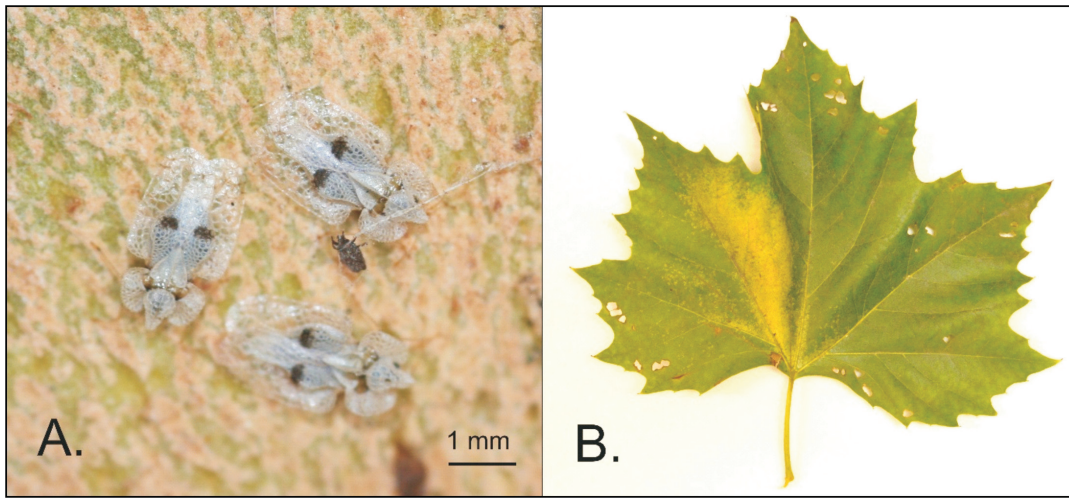


**Fig. 1**. **A**, *Corythucha ciliata* collected from Newlands, Cape Town, showing paired brown pigmentation on raised portion of hemelytra. **B**, *C. ciliata* feeding damage on leaf of *Platanus* × *acerifolia*. (Image in colour online.)

survive lengthy periods at low temperatures without food.

In winter *C. ciliata* hibernates under flaking bark of its host tree, emerging in spring to colonize the new leaves, forming dense colonies on their undersides and congregating along the leaf veins. The life cycle can be completed within 35 days under typical North American summer temperatures (CABI 2014), and in temperate regions two generations are completed during the course of a summer (Özsi *et al.* 2005). Leaf damage becomes apparent in late summer, beginning with white stippling on leaves, which gradually develops into partial bronzing and fading (chlorosis). Damaged

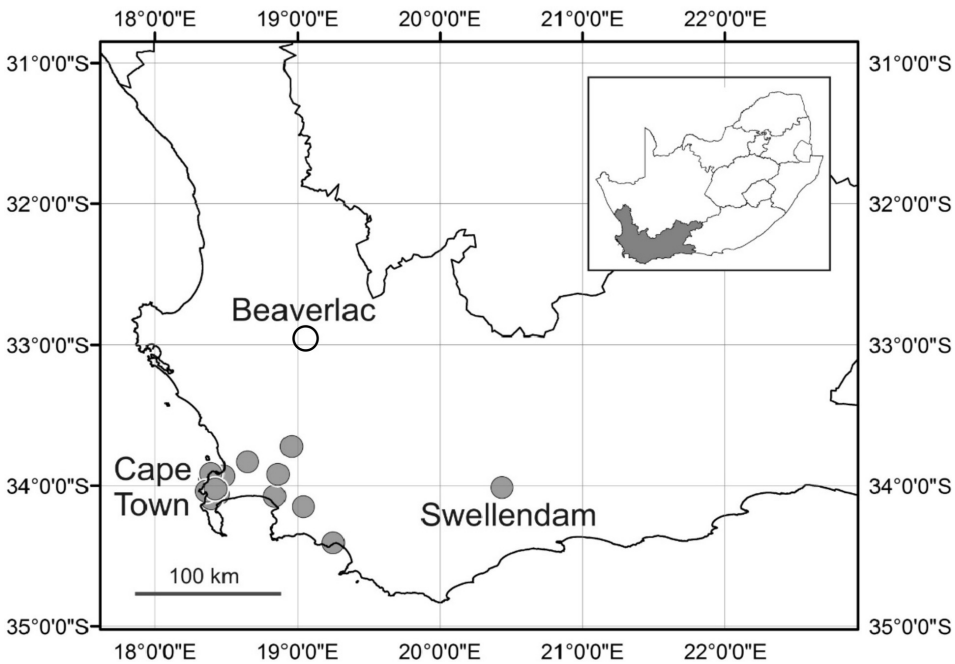


**Fig. 2**. Sampled distribution of *Corythucha ciliata* in the Western Cape Province, South Africa. The open circle indicates the absence of *C. ciliata* at one sampling site (Beaverlac).

leaves abscise earlier than normal, and consecutive years of heavy infestations in combination with environmental stress such as hot and dry summers, may kill infected trees (Barnard & Dixon 1983). In northern Italy, *C. ciliata* is also a vector of two pathogenic fungi (*Ceratocystis fimbriata* f. *platani* and *Apiognomonia veneta*), which when present with the bug can cause decline and death of the trees (Malumphy *et al*. 2007). DNA fingerprinting suggests that the southern European populations of *C. fimbriata* f. *platani* are genetically identical, and may represent a recent colonization from the Eastern parts of North America, the likely native range of the fungus (Englebrecht *et al.* 2004). Various species of *Ceratocystis*, including members of the *C. fimbriata* species complex, are known from South Africa from a range of host trees. If *C. fimbriata* f. *platani* reaches South Africa it could act synergistically with *C. ciliata* to destroy plane trees, as has been the case in Italy (Malumphy *et al*. 2007). Since *C. ciliata* is a known vector of *Ceratocystis fimbriata* f. *platani* (Maceljski 1986) it is possible that the fungus was also introduced to the Western Cape Province along with *C. ciliate.* However, to date this has not been detected.

## ACKNOWLEDGEMENTS

Our thanks to the DST-NRF Centre of Excellence for Invasion Biology for funding support for this study and to A. Wright and R. Griffiths for assistance with the field surveys. The source of the shapefile for the distribution map was Naude *et al.* (2007). The two reviewers are thanked for their useful comments.

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Accepted 27 October 2014