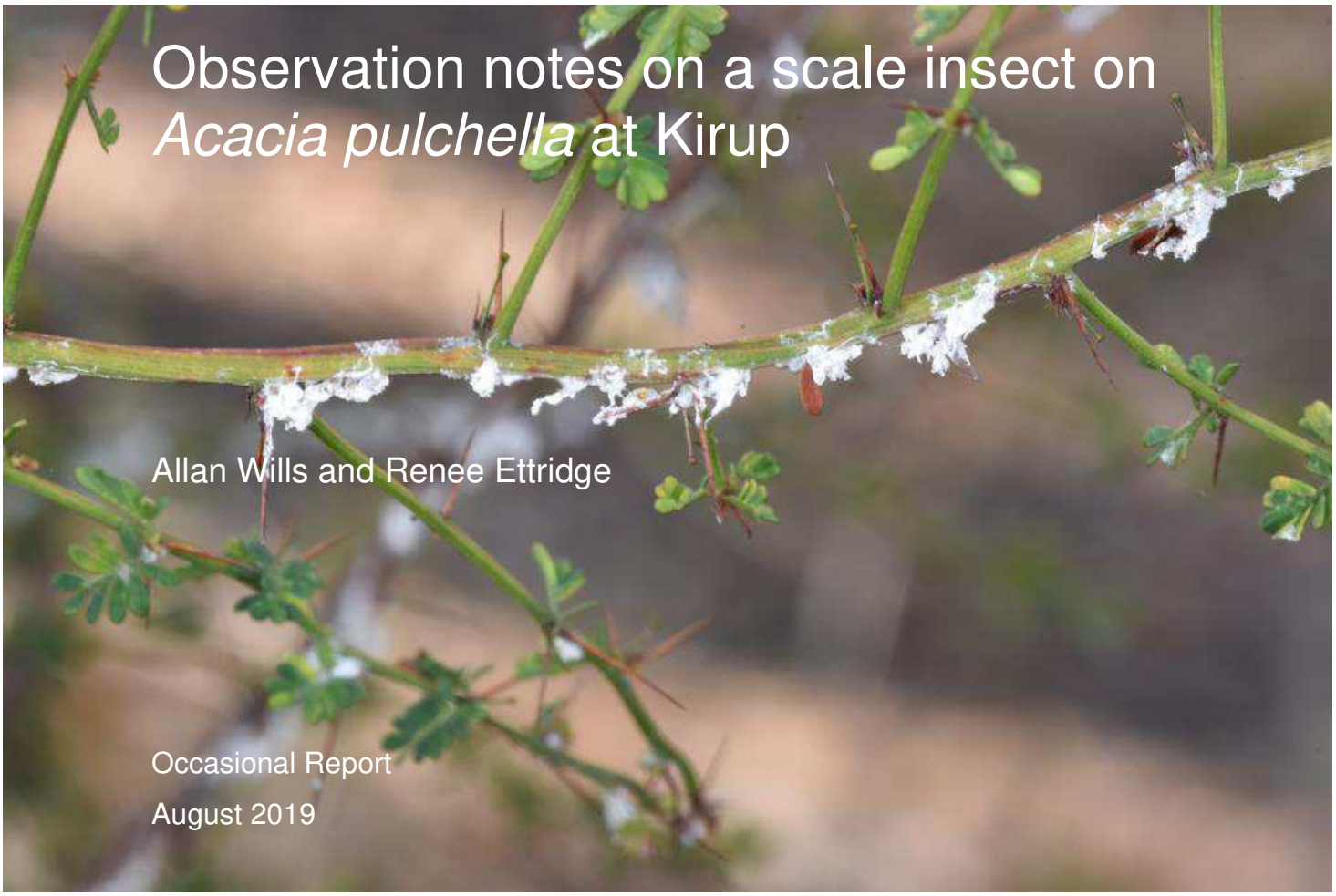
Biodiversity and Conservation Science

Observation notes on a scale insect on *Acacia pulchella* at Kirup



Allan Wills and Renee Ettridge

Occasional Report
August 2019

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

Department of Biodiversity, Conservation and Attractions
Locked Bag 104
Bentley Delivery Centre WA 6983
Phone: (08) 9219 9000
Fax: (08) 9334 0498

www.dbca.wa.gov.au

August 2019

This report/document/publication was prepared by Allan Wills and Renee Ettridge

Questions regarding the use of this material should be directed to:
Allan Wills
Senior Technical Officer
Biodiversity and Conservation Science
Department of Biodiversity, Conservation and Attractions
Locked Bag 2
Manjimup WA 6258
Phone: 0438996352
Email: allan.wills@dbca.wa.gov.au

The recommended reference for this publication is:
Allan Wills and Renee Ettridge, 2019, *Observation notes of a scale insect on* Acacia pulchella *at Kirup*, Department of Biodiversity, Conservation and Attractions, Perth.

This document is available in alternative formats on request.

Cover image of coccid scales on *Acacia pulchella* by Allan Wills

Contents

Figures

Acknowledgments

Notification of unusual biological phenomena in the forest relies on a network involving the members of the public who are often first to note changes in their local area, a receptive ear or recorder to gather and to pass on the information, and a host of supplementary observers and interpreters to place the observation into context. Where possible we have acknowledged those participants in the text of the following.

Summary

- In the last week of July 2019 a local resident of Kirup reported via Brett Fitzgerald of DBCA "*Acacia pulchella* plants which appear to have a type of scale infestation on the plants… Some of the plants are dead and others are infested and seem to be dying."
- In the absence of images or specimens in the initial report, DBCA personnel from Blackwood District and Biodiversity and Conservation Science separately inspected the site and noted symptoms and extent of the phenomenon.
- Cottony scales about 6 to 8 mm long were present on the stems of living and dead *Acacia pulchella* and living and dead *A. pulchella* were free from the cottony scales.
- All other understorey species were noted to be free of cottony scales.
- *Acacia pulchella* is known to have a relatively short lifespan compared to other understorey species and the senescence observed at Kirup is not unusual. We suggest that the presence of the scale is not causal to senescence and mortality of *A. pulchella* in the present instance.
- Images and description of host, pest, and location were referred to the MYPESTGUIDE facility on the DPIRD web site for identification of the insect and permanent capture of the observations.

1 Background and initial reporting

In the last week of July 2019 a local resident of Kirup pointed out to her son Brett Fitzgerald of DBCA

"*Acacia pulchella* plants which appear to have a type of scale infestation on the plants. Some of the plants are dead and others are infested and seem to be dying. I can't recall seeing a scale affecting native shrubs like that previously. The plants are located in a half hectare area in the vicinity on the 5 chain break behind the houses on the western side of Upper Capel road near the Kirup DBCA Office. The approximate location is 115.88878 E , -33.70511 S."

The details of the observation passed to Bob Hagan and Emer O'Gara who CC'd them to Allan Wills of Biodiversity and Conservation Science Manjimup.

1.1 Confirmation of initial observations

In the absence of images accompanying the report, the site was inspected by Allan Wills on 8 August 2019. Who confirmed the location (Figure 1) and initial observations to Emer O'Gara as follows:

"Looked at this today. Symptoms and location as described. The *Acacia pulchella* looks to be self-thinning by senescing as per its normal lifespan. Scale insects are present on living and dead plants and there are living and dead plants without scale insects. Scale insects often attack stressed and senescing plants."

The site was also inspected later by Renee Ettridge of DBCA Blackwood District who reported as follows:

"I have taken a couple of photos of some of the *Acacia pulchella* near Kirup. Most of them had the scale on them (~90%) although the majority of the plants I saw looked pretty healthy with the odd dead *A.pulchella.* I noticed most of the plants with the scale had small ants on them/these areas. Other species in the area that didn't have the scale include *Acacia dealbata*, *Chamaecytisus palmensis, Hibbertia sp., Hakea sp., Podocarpus drouynianus* and *Eucalyptus marginata* (which wasn't looking that healthy, most had [other] insect damage)."

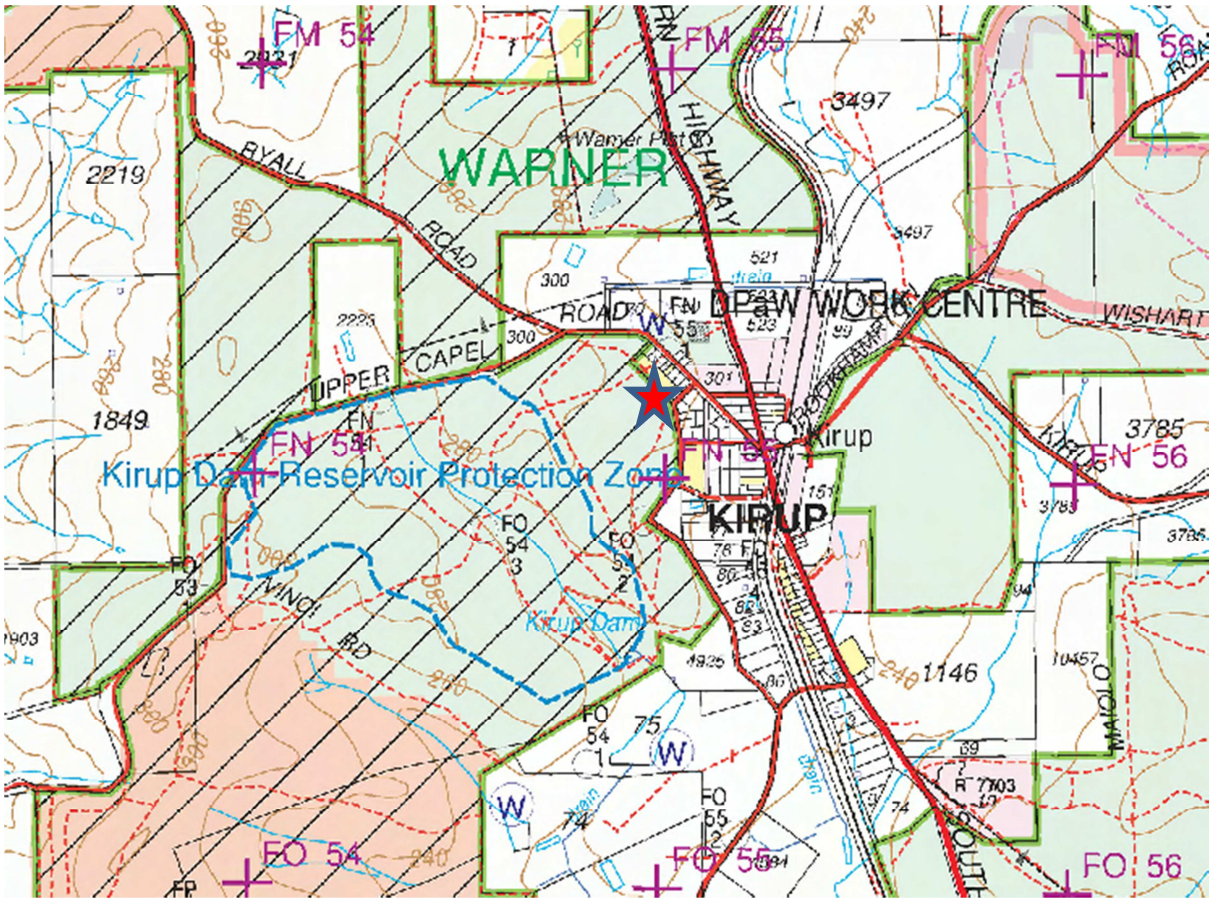


Figure 1 Location of affected Acacia pulchella *marked by a red star.*

2 Description of symptoms

2.1 *Acacia pulchella*

Acacia pulchella is an understorey species of jarrah forest and other vegetation types. It can behave as a 'fire weed', germinating prolifically after fire (Portlock et al. 1990) and possessing a relatively short life-span and senescing to low density within a decade in comparison to other perennial understorey shrubs (Monk et al.1981).

Cottony scales (Figure 4) about 6 to 8 mm long were present on the stems of living and dead *Acacia pulchella* and living and dead *A. pulchella* were free from the cottony scales (Figures 1 and 2).

Other species noted to be free of cottony scales were *Acacia dealbata*, *Chamaecytisus palmensis, Hibbertia sp., Hakea sp., Podocarpus drouynianus* and *Eucalyptus marginata.* At another nearby site about 2 km away on the Upper Capel Road there were living and dead *A. pulchella* and no evidence of the cottony scales present.

Figure 2 Live Acacia pulchella *shrub with densely aggregated coccid scales on stems. Photo by Renee Ettridge.*

Figure 3 Dead and live Acacia pulchella *in the mixed shrub understorey at Kirup. Photo by Allan Wills.*

2.2 Coccid scales

The larvae and female adults of scale insects pierce the epidermis of plants and feed on sap. A waxy covering is secreted and the insects live under this scale-like secretion. Excess sugars from the sap are secreted also, attracting ants which harvest the sugar and protect the scales from predation. Further information on scale insects can be found on the DPIRD website at https://www.agric.wa.gov.au/control-methods/aphids-mealybugs-and-scales .

Cottony scales were present on the stems of *Acacia pulchella* (Figures 4 and 5). Correspondence through Emer O'Gara with a wider network of personnel working in forest areas indicated the presence of scales on *A. pulchella* appeared to be localised to the immediate vicinity described in the initial notification.

Cottony scales are not unique to a single species of coccid. Identification of Coccoidea is usually based on adult female specimens and their microscopic features visible after maceration and careful preparation of slide-mounted specimens. Only larval forms were found in the present case. *Eurycoccus yanchepae*, a Pseudoccidae, is known from *A. pulchella*, however the description is based on an adult female (Brooks 1972).

Images and description of host, pest, and location were referred to the MYPESTGUIDE tool on the DPIRD web site for identification. The output report from that facility based on the appropriate and best available entomological expertise is available at https://mypestguide.agric.wa.gov.au/reporter/#/report/9135a643-88f9-4c38-890b-506a5cf68013 .

Figure 4 Coccid scales on live Acacia pulchella *at Kirup. Photo by Allan Wills.*

Figure 5 Coccid larvae on live Acacia pulchella *at Kirup. Length 1.1 mm. Photo by Allan Wills.*

3 Interpretation of observations

Acacia pulchella is known to have a relatively short lifespan compared to other understorey species and the senescence observed at Kirup is not unusual. While mortality or stress of Acacia has been attributed to infestation of scale insects elsewhere in Australia (Brookes 1972, Khan et al. 2014), we suggest that the presence of the scale is not causal to the senescence and mortality of *A. pulchella* in the present instance.

Hemipterans, which include Coccoidea, tend to be specialised to particular hosts and specific to particular locations at particular times (Moir et al. 2011). Coccoidea of native Western Australian *Acacia* spp. are likely to be only partially documented (Williams 1985), and often require a specialist for identification. The MYPESTGUIDE tool at https://mypestguide.agric.wa.gov.au/reporter/#/ allows appropriate access to such a pool of expertise.

Direct reporting by the public to the MYPESTGUIDE via website or phone/tablet app has potential economic benefits in the case of reporting pests of economic and ecological importance, allows capture of data in a permanent manner, and allows appropriate triage of responses and notifications at a local, state and national level, and in extreme cases initiation of precautions or control measures for biosecurity.

References

Brookes, H.M. (1972). Two species of Eurycoccus Ferris on Acacia in Australia (Homoptera: Pseudococcidae). *Journal of the Australian Entomological Society*, *11*(2), pp.129-134.

Khan, A. N., Sharma, A., Raman, A., Dhileepan, K., & Hodgkins, D. S. (2014). Biological management of the invasive Vachellia nilotica ssp. indica (Benth.) Kyal. & Boatwr.(Fabales: Mimosoideae) in tropical Australia: stress-inducing potential of Anomalococcus indicus Ramakrishna (Insecta: Hemiptera: Coccoidea: Lecanodiaspididae), an agent of promise. *Arboricultural Journal: The International Journal of Urban Forestry*, *36*(2), 63-75.

Moir, M.L., Brennan, K.E., Fletcher, M.J., Majer, J.D. and Koch, J.M., 2011. Multi-scale patterns in the host specificity of plant-dwelling arthropods: the influence of host plant and temporal variation on species richness and assemblage composition of true bugs (Hemiptera). *Journal of Natural History*, *45*(41-42), pp.2577-2604.

Monk, D., Pate, J.S. and Loneragan, W.A. (1981). Biology of Acacia pulchella R. Br. with special reference to symbiotic nitrogen fixation. *Australian Journal of Botany*, *29*(5), 579-592.

Portlock,C.C,Shea,S.R.,Majer,J.D.,Bell,D.T. (1990). Stimulation of germination of Acacia Pulchella: laboratory basis for forest management options, Journal of Applied Ecology,27, 319-324.

Williams, D. J. (1985). *Australian mealybugs*. British Museum (Natural History).