

LARVAL HOST PLANTS OF *SCOLECOBROTUS* SPP. (COLEOPTERA: CERAMBYCIDAE) IN SOUTHERN SYDNEY (NEW SOUTH WALES, AUSTRALIA)

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Summary

The range of larval host plants for *Scolecobrotus westwoodi* Hope is expanded to include multiple species of *Eucalyptus*, *Corymbia* and *Angophora* in the Sydney region. Larval host records for *Scolecobrotus variegatus* Blackburn are presented for the first time. Adult *S. westwoodi* and *S. variegatus* were reared from a range of species in the *Eucalyptus* group (Myrtaceae) and sometimes from the same plant host. The two species differ in colour pattern and body length but are otherwise similar in biology in terms of host preferences and larval host damage.

Key Words *Scolecobrotus*, larval host plants, Uracanthini, *Eucalyptus*, *Corymbia*, *Angophora*

INTRODUCTION

Scolecobrotus westwoodi Hope has been recorded infesting species of *Eucalyptus* and *Corymbia* (Barnard and French 1913, Best 1898, Dixon 1908, Duffy 1963, Froggatt 1894; 1923, Hawkeswood 1992, Webb 1987). Since some of these earlier records, *Corymbia* has been elevated to species status (Hill and Johnson 1995) and now what was *Eucalyptus gummifera* Gaertner is the type species for *Corymbia* – *C. gummifera* (Gaertn.) K.D.Hill & L.A.S.Johnson. *Angophora* has not previously been recorded as a host plant for *S. westwoodi*. There do not appear to be any previous published host plant records for *Scolecobrotus variegatus* Blackburn other than a specimen in the Australian National Insect Collection (Canberra) attributed to Walter Froggatt collected from “Forbes” gum (Webb 1987).

Infested branches and regrowth stems of species of *Eucalyptus*, *Corymbia* and *Angophora* were collected from various locations in southern Sydney (New South Wales) during 2020-23 and maintained in plastic tubs under semi-controlled conditions.

RESULTS AND DISCUSSION

Both species of *Scolecobrotus* appear to infest branches, as well as regrowth stems often following fire (Figure 1). The typical sign of damage is the browning off of branches at various levels above ground and often very high in tall trees (Figure 1).

Larvae of *Scolecobrotus* ringbark the branch or stem and then tunnel towards the distal end of the branch or stem, returning later to pupate close to the point of excision (Figure 1, 2). The damage caused by ringbarking may result in the branch/stem breaking off under high winds or other stresses (personal observation). Due to this, Froggatt (1894) noted that *S. westwoodi* may inhabit the distal (broken off end) of the branch or the still attached part of the branch. In this study, adults were generally reared from the distal

end of the branch but in some cases from the still attached part of the branch, once removed. In this study there was no clear distinction between the damage caused by the two species.

Best (1898) noted that *S. westwoodi* emerges from infested branches in the August-September period and Hawkeswood removed a presumably pre-emergent adult from an infested branch in August. In this study many adults did emerge during that the August – September period (40% of total for both species) but adults did emerge in almost all months of the year except January. The dispersion of emergence dates could be due to the artificial confinement under controlled conditions in the laboratory and the fact that some were cut from their pupal chambers before emergence would normally occur. Six fully formed adults were cut from their pupal chambers in April (2), June (3) and July (1).

Several species of *Eucalyptus* and *C. gummifera* have been previously recorded as larval hosts of *S. westwoodi*. Of these only *Eucalyptus gracilis* (Froggatt 1894), *Eucalyptus melliodora* (Best, 1898, Dixon 1908), *C. gummifera* (Froggatt, 1894), and *C. intermedia* (Hawkeswood 1992) were specifically identified. Other records were for unknown host species or known only by their common names (Barnard and French, 1913, Goudie, 1925 Webb, 1987).

In this study, both species of *Scolecobrotus* were reared from a range of host species (Table 1) across the three plant genera. Both species were found in *C. eximia* and *C. gummifera* as well as the eucalypts *E. camfieldii*, *E. capitellata* and *E. haemostoma*. For all other host species, just one species was reared (*A. costata*, *E. obstans* and *E. sieberi* for *S. westwoodi* and *A. hispida*, *E. punctata* and *E. squamosa* for *S. variegatus*).

Figure 1 A. Typical high canopy damage by *Scolecobrotus westwoodi*; B. Typical regrowth damage in *Corymbia gummifera* by *Scolecobrotus variegatus* showing ringbarked stem; C. Early damage by *Scolecobrotus westwoodi* on *Eucalyptus obstans* branch showing ringbarked end and frass hole; D. Damaged branch showing emergence hole of *Scolecobrotus westwoodi*.

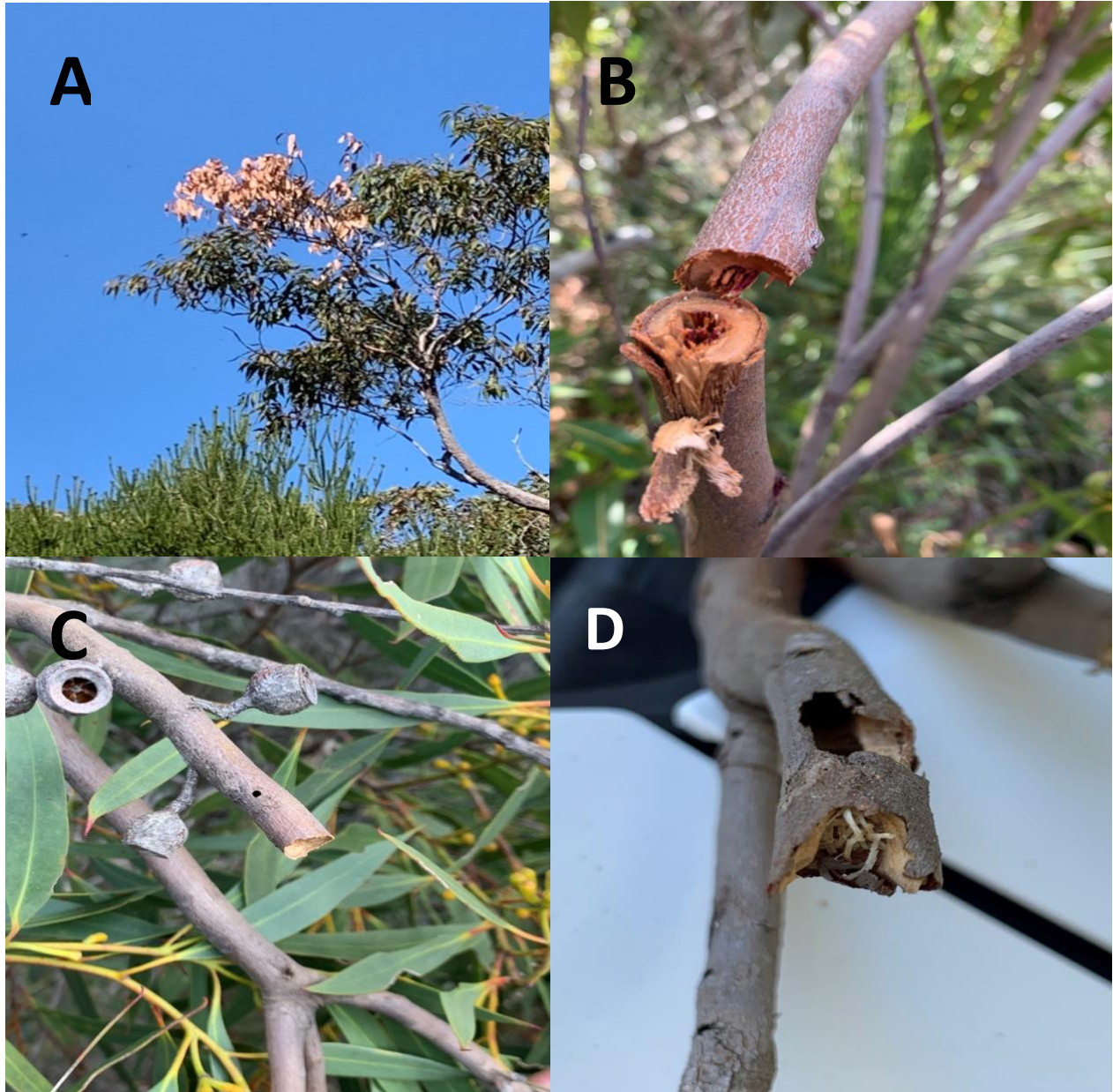
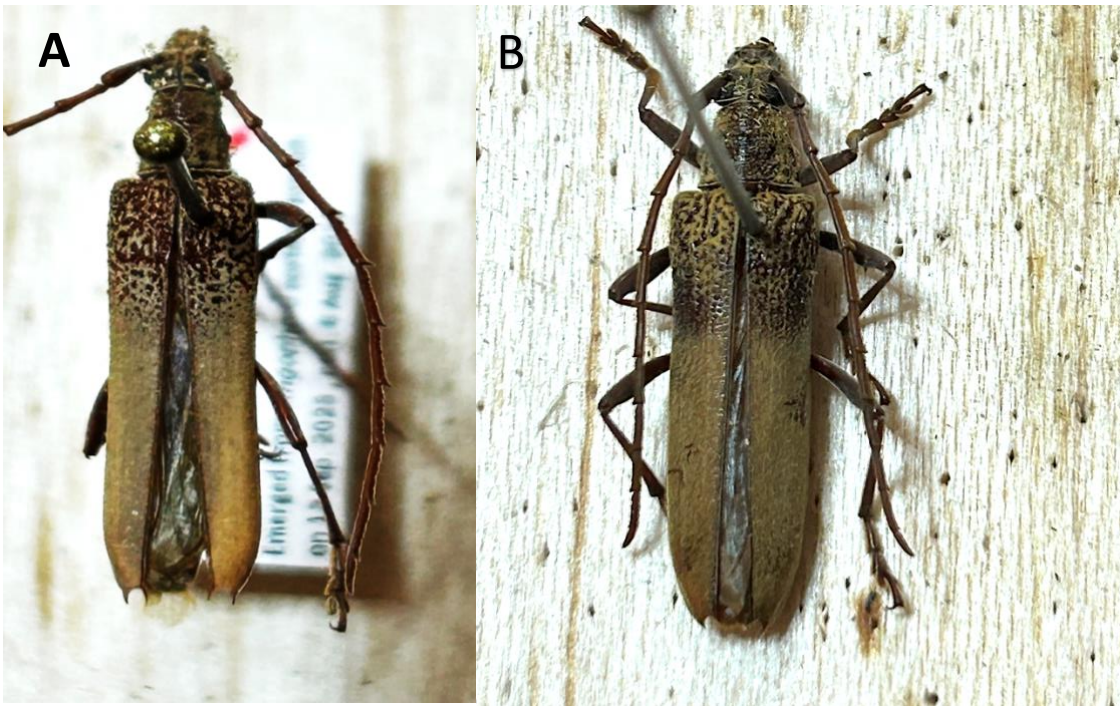


Figure 2 A. Late stage larva of *Scolecobrotus westwoodi*; B. Pupa of *Scolecobrotus westwoodi*; C. and D. Pre-emergent *Scolecobrotus westwoodi* in pupal chambers.



Figure 3 A. *Scolecobrotus westwoodi* adult; B. *Scolecobrotus variegatus* adult**Table 1:** Larval hosts for *Scolecobrotus westwoodi* and *Scolecobrotus variabilis*

Host species	<i>S. westwoodi</i>	<i>S. variabilis</i>
<i>Angophora costata</i> (Gaertn.) Britten	X	
<i>Angophora hispida</i> (Sm.) Blaxell		X
<i>Corymbia eximia</i> (Schauer) K.D.Hill & L.A.S.Johnson	X	X
<i>Corymbia gummifera</i> (Gaertn.) K.D.Hill & L.A.S.Johnson	X	X
<i>Eucalyptus camfieldii</i> Maiden	X	X
<i>Eucalyptus capitellata</i> Sm.	X	X
<i>Eucalyptus haemastoma</i> Sm.	X	X
<i>Eucalyptus obstans</i> L.A.S.Johnson & K.D.Hill	X	
<i>Eucalyptus punctata</i> DC.		X
<i>Eucalyptus sieberi</i> L.A.S.Johnson	X	
<i>Eucalyptus squamosa</i> Maiden & Deane		X

At Menai, where many host plant samples were collected, fire caused significant damage to the native vegetation in early 2018 (Anonymous 2018). Regrowth of *Eucalyptus* and *Corymbia* species from fire tolerate forms resulted in dense regrowth of some species which provided larval host material for both *Scolecobrotus* spp. and many other species that infest timber (Cerambycidae, Buprestidae and Curculionidae). The most obvious examples of this regrowth after fire were *E. squamosus* and *C. gummifera*. *E. squamosus* regrowth was heavily infested with *S. variegatus* in the years following the fire whilst regrowth stems of *C. gummifera* were only occasionally infested with either species. There was no evidence of *S. westwoodi* infesting *E. squamosus*. Both species were reared from infested *C. eximia*, *E. capitellata* and *E. haemostoma* in the Menai area but this was always in upper branches, not in regrowth stems.

Hawkeswood (1992) suggested that *S. westwoodi* was monophagic on *Eucalyptus*. While *Corymbia* has since been elevated to generic status, the notion remains correct because the additional larval host plants provided here are all either *Eucalyptus* or *Corymbia*, with the exception of a few records from *Angophora*, which is closely related. The notion is also likely correct for *S. variegatus*.

It should be noted that the two species are very similar in appearance (Figure 3) with *S. variegatus* having a variable dark patch below the granulated shoulder patch on both species. *S. westwoodi* is generally lighter in colour than *S. variegatus* and some Queensland specimens held in the Queensland Museum collection are actually pink in colour (pers. obs.). There appears to be no clear delineation in body length, at least in terms of range, but on average *S. westwoodi* is 5mm longer than *S. variegatus* from the material reared in this study. *S. westwoodi* ranges in size from 16-32 mm (mean = 24.8 mm, n = 40) and *S. variegatus* ranges in size from 15-27 mm (mean = 19.3 mm, n = 20). Goudie (1925) suggested that *S. variegatus* was considered by some entomologists to be the same as *S.*

westwoodi. This remains to be determined but there does appear to be some overlap in colour pattern and size.

Hawkeswood (1992) suggested that because *S. westwoodi* is rarely collected as an adult, the species may be declining. However, the data here suggests that *S. westwoodi* and *S. variegatus* are relatively common in the Sydney region at least.

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Appendix 1: Larval host records for *Scolecobrotus westwoodi* and *Scolecobrotus variabilis****S. westwoodi******Angophora costata* (Gaertn.) Britten**

1. NSW, Menai, Heathcote Rd, collected on 8 August 2022, emerged 15 September 2023 (1 specimen).

***Corymbia eximia* (Schauer) K.D.Hill & L.A.S.Johnson**

1. NSW, Menai, Heathcote Rd, collected on 23 August 2021, cut live from branch 1 June 2022 (1 specimen).
2. NSW, Menai, Heathcote Rd, collected on 4 September 2021, emerged 25 November 2021 (1 specimen).
3. NSW, Menai, Heathcote Rd, collected on 6 September 2021, emerged 6 November 2021 & 20 December 2022 (2 specimen).
4. NSW, Menai, Heathcote Rd, collected on 24 September 2021, emerged 24 February 2022 (1 specimen).
5. NSW, Menai, Heathcote Rd, collected on 2 September 2022, emerged 14 November 2023 (1 specimen).

***Corymbia gummifera* (Gaertn.) K.D.Hill & L.A.S.Johnson**

1. NSW, Royal National Park, Garrawarra Farm, collected on 31 July 2020, emerged 18 February, 9 and 31 March 2021 (4 specimens).
2. NSW, Royal National Park, Wattamolla, collected on 11 August 2020, emerged 20 May 2021 (1 specimen).
3. NSW, Royal National Park, Wattamolla, collected on 1 September 2020, emerged 15 April 2021 (1 specimen).
4. NSW, Royal National Park, Wattamolla, collected on 15 September 2020, emerged 20 March 2021 (1 specimen).
5. NSW, Royal National Park, Winifred Falls Fire Trail, collected on 18 September 2020, emerged 26 November 2021 (1 specimen).
6. NSW, Royal National Park, Wattamolla, collected on 27 September 2020, emerged 15 March 2022 (1 specimen).
7. NSW, Menai, Heathcote Rd, collected on 23 August 2021, emerged 1 May 2022 (1 specimen).
8. NSW, Royal National Park, Curra Moors Fire Trail, collected on 26 August 2021, emerged 1 July 2022 (1 specimen).

***Eucalyptus camfieldii* Maiden**

1. NSW, Royal National Park, Wattamolla, collected on 1 September 2020, emerged 22 February 2021 (1 specimen).
2. NSW, Royal National Park, Wattamolla, collected on 5 September 2020, emerged 18 February 2021 (2 specimens).
3. NSW, Royal National Park, Wattamolla, collected on 15 September 2020, emerged 16 March, 2 April 2021 (3 specimens).
4. NSW, Royal National Park, Wises Fire Trail, collected on 18 September 2020, cut live 18 April 2021 (1 specimen).
5. NSW, Kuring-gai Chase National Park, Elvina Trailhead, collected on 20 October 2020, cut live from branch 8 April 2021 (1 specimen).
6. NSW, Royal National Park, Curra Moors Fire Trail, collected on 2 April 2021, emerged 1 June 2022 (1 specimen).
7. NSW, Royal National Park, Wattamolla, collected on 30 August 2021, emerged 22 August 2022 (1 specimen).
8. NSW, Royal National Park, Wattamolla, collected on 28 October 2021, emerged 22 August 2022 (1 specimen).

***Eucalyptus capitellata* Sm.**

1. NSW, Royal National Park, Warumbul Rd, collected on 2 February 2021, cut dead from branch on 1 June 2022 (1 specimen).

***Eucalyptus haemastoma* Sm.**

1. NSW, Royal National Park, Mount Bass Fire Trail, collected on 28 August 2020, cut live 15 July 2021 (1 specimen).
2. NSW, Menai, Heathcote Rd, collected on 29 August 2021, emerged 1 July 2022 (1 specimen).

***Eucalyptus obstans* L.A.S.Johnson & K.D.Hill**

1. NSW, Royal National Park, Wattamolla, collected on 1 September 2020, emerged 16 March, 2 April, 10 September 2021 (5 specimens).
2. NSW, Royal National Park, Bundeena Rd turnoff, collected on 31 July 2021, cut live from branch 1 June 2022 (1 specimen).

3. NSW, Royal National Park, Costens Point Fire Trail, collected on 10 August 2021, cut live from branch 1 June 2022 (1 specimen).
4. NSW, Royal National Park, Curra Moors Fire Trail, collected on 1 September 2021, emerged 1 August 2022 (1 specimen).

***Eucalyptus sieberi* L.A.S.Johnson**

1. NSW, Helensburgh, collected on 6 October 2020, emerged 2 March 2021 (1 specimen).

S. variabilis***Angophora hispida* (Sm.) Blaxell**

1. NSW, Menai, Heathcote Rd, collected on 16 August 2022, emerged 10 August 2023 (2 specimens).

***Corymbia eximia* (Schauer) K.D.Hill & L.A.S.Johnson**

1. NSW, Menai, Heathcote Rd, collected on 8 September 2022, emerged 11 September 2023 (1 specimens).

***Corymbia gummifera* (Gaertn.) K.D.Hill & L.A.S.Johnson**

1. NSW, Menai, Heathcote Rd, collected on 29 September 2020, emerged 1 August 2022 (1 specimen).
2. NSW, Menai, Heathcote Rd, collected on 1 January 2021, emerged 31 August 2022 (1 specimen).

***Eucalyptus camfieldii* Maiden**

1. NSW, Royal National Park, Wattamolla, collected on 24 September 2021, emerged 15 May 2022 (1 specimen).

***Eucalyptus capitellata* Sm.**

1. NSW, Menai, Heathcote Rd, collected on 24 August 2021, emerged 5 October 2021 (1 specimen).

***Eucalyptus haemastoma* Sm.**

1. NSW, Menai, Heathcote Rd, collected on 23 August 2021, emerged 30 August 2022 (1 specimen).

***Eucalyptus punctata* DC.**

1. NSW, Caringbah, collected on 22 February 2021, emerged 22 December 2021 (1 specimen).

***Eucalyptus squamosa* Maiden & Deane**

1. NSW, Menai, Heathcote Rd, collected on 23 August 2021, emerged 2, 15, 31 August 2022, 27 August, 5 September 2023 (11 specimens).