

A new larval host plant for the Australian buprestid beetle *Agrilus australasiae* Laporte & Gory (Coleoptera: Buprestidae)

With 1 Figure and 2 Tables

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Abstract: A new larval host plant, *Acacia dealbata* Link (Mimosaceae), is recorded here for the Australian jewel beetle, *Agrilus australasiae* Laporte & Gory (Coleoptera: Buprestidae: Agrilinae). Its larval/pupal chambers are described and known larval and adult host/food plants listed. The known larval host plants are all *Acacia* species, viz. *A. dealbata* Link., *A. pycnantha* Benth. and *A. sophorae* (Labill.) R. Br. The adults are known to feed on the leaves of *Acacia dealbata* Link, *A. decurrens* (Wendl.) Willd., *A. parramattensis* Tindale and *A. sophorae* (Labill.) R. Br.

Zusammenfassung: *Acacia dealbata* Link (Mimosaceae) ist als neue Wirtspflanze der Larven des australischen Prachtkäfers *Agrilus australasiae* Laporte & Gory (Col.: Buprestidae) festgestellt worden. Es werden die Puppenwiegen des Käfers beschrieben und bekannte Wirtspflanzen seiner Larven und Imagines aufgelistet. Die bekannten Wirtspflanzen der Larven sind *Acacia dealbata* Link, *A. pycnantha* Benth. und *A. sophorae* (Labill.) R. Br. Von den Adulten ist bekannt, daß sie von Blättern der *Acacia dealbata*, *A. decurrens* (Wendl.) Willd., *A. parramattensis* Tindale und *A. sophorae* fressen.

Introduction

The Grey-striped Agrilus, *Agrilus australasiae* Laporte & Gory (Coleoptera: Buprestidae: Agrilinae) (Fig. 1 a), is a small, bronze-copper to brownish coloured beetle with white/cream stripes and other marks (aggregated setae) on the lateral margins of the body and appears to be restricted to eastern and southern Australia. The biology and adult/larval food plants of this buprestid were recently reviewed by HAWKESWOOD (1992). Since then we have located a further larval host reference in the literature and made additional observations on its biology and larval host plants. These data are described below.

Observations

On 4 November 1995, the first author visited the Hill End area of New South Wales, in order to gather insect material for a paper on a new species of *Melobasis*. During this field work, billets of *Acacia dealbata* Link (Mimosaceae) were dissected and a number of specimens of *Agrilus australasiae* Laporte & Gory were found dead in their pupal chambers around the base of a mature, 7-metre tall tree of *A. dealbata*. This plant was located on the eastern side of Warrys Road, Hill End, New South Wales (c. 33° 02' S, 149° 25' E). The exit holes were grouped together down one side of the tree and the pronotums of several dead beetles in their exit holes were visible from the outside. The exit holes were similar to each other in shape, although a number were upside-down. (The exit hole of *A. australasiae* is distinctive in that it is semicircular but one side is more convex than the other, Fig. 1 c). If the more convex side was situated downwards facing, the larval chamber proceeded inwards and downwards into the wood, and the reverse was true if the more convex side of the exit hole faced upwards, (Fig. 1 e). Although the antennal cavities and eyes of all the dead

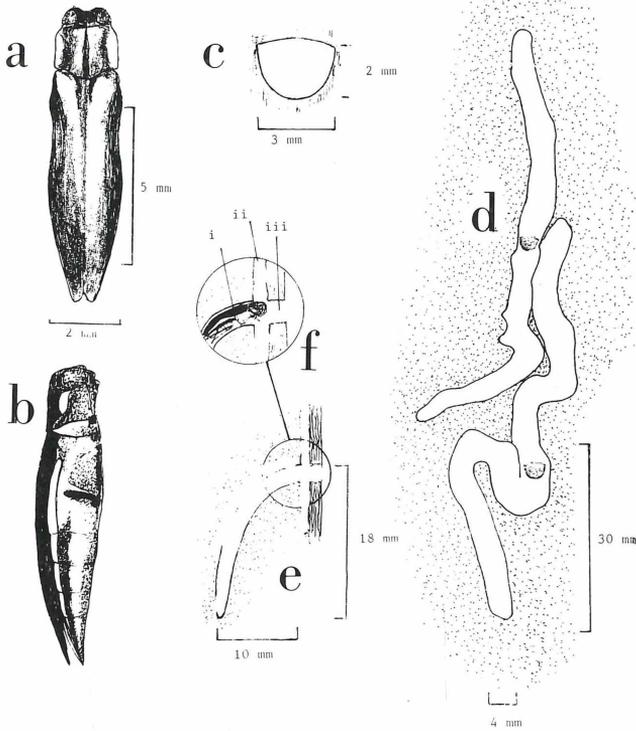


Fig. 1. *Agrilus australasiae* Laporte & Gory; a: Adult male (dorsal view); b: Adult male (lateral view); c: Exit hole for downward facing pupal chamber; d: Larval chambers are often grouped together being 70 mm–90 mm in length and 4 mm wide \times 1 mm deep, the exit hole being situated midway along; e: View of a downward facing pupal chamber in sapwood of *Acacia dealbata* Link; f: Detail of pupal chamber showing, i. adult in chamber, ii. larval chamber between bark and sapwood, iii. bark 1 mm thick with exit hole. (Drawings by J. R. TURNER)

specimens had been damaged, the remainder of each specimen was intact and well preserved. The specimens were therefore easily identified when compared to named specimens in the collection of J. R. Turner and the Australian Museum in Sydney, New South Wales.

Discussion

The presently known larval and adult host plants of *Agrilus australasiae* are provided in Tables 1 and 2 respectively.

HAWKESWOOD (1992) stated that FROGGATT (1902) was the first author to record any biological data for the species, but since then we have located the overlooked research of TEPPER (1887) who noted that the larvae of *A. australasiae* lived in the bark and sapwood of *Acacia pycnantha* Benth. (Mimosaceae) in South Australia (specific area not cited). FROGGATT (1902) must have been aware of the work of TEPPER (1887) but nowhere in his many publications is TEPPER quoted. FROGGATT (1927) later recorded *A. pycnantha* as a larval host for *A. australasiae* but again did not cite TEPPER's (1887) earlier and original record.

VAN DEN BERG (1982) recorded *A. dealbata* as an adult food plant of *A. australasiae* but did not cite the locality or any other collection details concerning his record. During 1983

Table 1. Summary of the known larval host plants, localities, habitat data and references for *Agrilus australasiae* Laporte & Gory (Modified from HAWKESWOOD 1992)

Host plant species	Locality	Habitat*	Reference
<i>Acacia dealbata</i> Link	Hill End, New South Wales	DH	TURNER & HAWKESWOOD (this paper)
<i>Acacia pycnantha</i> Benth.	South Australia	(?)	TEPPER (1887)
	Near Wee Waa, New South Wales	CW	FROGGATT (1927)
<i>Acacia sophorae</i> (Labill.) R. Br.	Hastings Point, New South Wales	SH/BW	VOLKOVITSH & HAWKESWOOD (1990); HAWKESWOOD (1992)

* CW = Closed woodland (= "pilliga scrub"); SH/BW = Sand dune habitat merging into *Banksia* woodland; DH = Disturbed habitat showing no evidence of original community structure – the area has scattered bushes and small trees of *Acacia dealbata* interspersed with blackberries, *Rubus vulgaris* L. (Rosaceae).

and 1984, JRT collected adults of *A. australasiae* feeding on the leaves of *A. dealbata* at Hill End, New South Wales, thereby confirming VAN DEN BERG's record (see also Table 2, this paper).

As a genus, *Agrilus* is polyphagous both in the larval and adult stages. In the United States of America, various *Agrilus* species have been recorded frequenting or feeding on the foliage of *Baccharis* (Asteraceae) (e.g. NELSON 1968; WALTERS 1978), *Hymenoclea* (Asteraceae) (e.g. WALTERS 1975, 1978), *Rhus* (Anacardiaceae) (e.g. NELSON 1965); *Ostrya* (Betulaceae) (e.g. NELSON & MCCRAE 1990), *Cassia* (Caesalpiniaceae) (e.g. WALTERS 1978), *Diospyros* (Ebenaceae), *Amorpha*, *Robinia* (Fabaceae), *Quercus* (Fagaceae), *Carya*, *Juglans* (Juglandaceae), *Celtis* (Moraceae), *Amelanchier*, *Crateagus* (Rosaceae) and *Salix* (Salicaceae) (NELSON & MCCRAE 1990) and *Acacia* (Mimosaceae) (e.g. WALTERS & BELLAMY 1982; NELSON & MCCRAE 1990) as well as many other genera and families. In Mexico, WESTCOTT et al. (1989) have recorded a number of adults of *Agrilus* species from the foliage of *Acacia* species (Mimosaceae) as well as from *Mimosa* (Mimosaceae), *Cassia* (Caesalpiniaceae), *Quercus* (Fagaceae) and *Sphaeralcea* (Malvaceae). In Africa, BELLAMY et al. (1988) recorded adults of four species of *Agrilus* from *Acacia* and *Mimosa* (Mimosaceae), while CURLETTI (1994) recorded *Acacia* as adult hosts for a number of species from the subgenus *Personatus* occurring in Ethiopia. In Papua New Guinea and the Philippines, *Agrilus occipitalis* Eschscholtz is associated with *Citrus* (Rutaceae) (MACABASCO 1964; BALTAZAR & SALAZAR 1979; HAWKESWOOD & TURNER 1994). Although the literature quoted above is only a fraction of that available on the biology and hosts of *Agrilus* of the world, it does indicate that *Acacia* and related plant genera are the preferred or primary food of adult *Agrilus* occurring in many tropical and sub-tropical, arid to semi-arid regions such as in Africa, Australia and Central America (Mexico), whereas in other areas of the world, a much broader food spectrum is utilized, many of which are botanically primitive plants such as Salicaceae, Fagaceae, Betulaceae and Rosaceae. Less data is available on *Agrilus* larval host plants, but the same trends in host plant utilization as displayed by the adults are apparent in the larvae. In the United States of America, larval hosts for *Agrilus* include *Rosa* (Rosaceae), *Carpinus* (Betulaceae), *Carya* (Juglandaceae) (NELSON & MCCRAE 1990), *Acacia* (Mimosaceae) (WALTERS & BELLAMY 1982) and *Phoradendron* (Loranthaceae) (NELSON 1990). Many hosts have been recorded for *Agrilus* species from Europe; BÍLY (1982) records the following hosts among others: *Betula*, *Carpinus* (Betulaceae), *Lonicera* (Caprifoliaceae), *Corylus* (Corylaceae), *Castanea*, *Fagus Quercus* (Fagaceae), *Fraxinus*, *Ligustrum*, *Syringa* (Oleaceae), *Rosa*, *Rubus* (Rosaceae) and *Populus*, *Salix* (Salicaceae). In Turkmenistan, *Agrilus ganglbaueri* breeds in *Salix* and *Populus* (Salicaceae) (VOLKOVITSH & ALEXEEV 1994). In New

Table 2. Summary of the known adult food plants, localities, habitat data and references for *Agrilus australasiae* Laporte & Gory (Modified from HAWKESWOOD 1992)

Food plant species	Locality	Habitat*	Reference
<i>Acacia dealbata</i> Link	(?)	(?)	VAN DEN BERG (1982)
	Hill End, New South Wales	DH	TURNER & HAWKESWOOD (this paper)
<i>Acacia decurrens</i> (Wendl.) Willd.	Mittagong, New South Wales	(?)	FROGGATT (1902, 1923)
	Waterfall, New South Wales	DSF/LOW	WILLIAMS & WILLIAMS (1983)
	Royal National Park, New South Wales	DSF/LOW	WILLIAMS & WILLIAMS (1983)
	Middle Dural, New South Wales	DSF	WILLIAMS & WILLIAMS (1983)
	Maroota, New South Wales	DSF	WILLIAMS & WILLIAMS (1983)
<i>Acacia parramattensis</i> Tindale	Lapstone Hill, lower Blue Mountains, New South Wales	DSF	WILLIAMS & WILLIAMS (1983)
	Mt. Boyce, upper Blue Mountains, New South Wales	MW	WILLIAMS & WILLIAMS (1983)
	Middle Dural, New South Wales	DSF	WILLIAMS & WILLIAMS (1983)
<i>Acacia sophorae</i> (Labill.) R. Br.	Mylestom Beach, New South Wales	SH/BW	HAWKESWOOD (1981)
	Hungry Head, New South Wales	SH/BW	HAWKESWOOD (1981)
	Hastings Point, New South Wales	SH/BW	HAWKESWOOD (1992)

* DH = Disturbed habitat showing no evidence of original community structure – the area has scattered bushes and small trees of *Acacia dealbata* interspersed with blackberries, *Rubus vulgaris* L. (Rosaceae); DSF = Dry sclerophyll forest; DSF/LOW = Dry sclerophyll forest merging into low open woodland; MW = Mallee dominated woodland; SH/BW = Sand dune habitat merging into *Banksia* woodland.

Guinea and the Philippines, *Agrilus occipitalis* Eschscholtz breeds in the wood of *Citrus* (Rutaceae) (MACABASCO 1964; BALTAZAR & SALAZAR 1979; HAWKESWOOD & TURNER 1994), while another New Guinean species, *A. viridissima* Cobos, is destructive to three species of *Terminalia* trees (Combretaceae) (MERCER 1985, 1986). In Australia, which is poorly represented with *Agrilus* species, *Acacia* appears to be the preferred larval host, at least for species not occurring in rain forests. Apart from the *Acacia* records noted above in this paper for *A. australasiae*, *Acacia leiocalyx* (Domin) Pedley has been listed as a larval host plant for *A. mastersi* Macleay (HAWKESWOOD & PETERSON 1982), while WILLIAMS (1985) has recorded the following hosts for *A. deauratus* Macleay from New South Wales: *Acacia longifolia* (Andr. Willd.) and an unidentified *Acacia* species (Mimosaceae), *Drypetes australasica* (J. Muell.) Pax. et Hoffm. (Euphorbiaceae) and *Eucalyptus paniculata* Sm. (Myrtaceae). The biology of *Agrilus australasiae* Laporte & Gory is reasonably well documented now with larval and adult host plants determined as well as larval morphology described (VOLKOVITSH & HAWKESWOOD 1990), however studies on intra-specific variation throughout the entire range of the species may be interesting and possibly reveal the identity of some subspecies. Additional *Acacia* hosts are likely to be discovered with further field research.

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