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A note on the larval host plants and biology of *Melobasis cupriceps* (Kirby) (Coleoptera: Buprestidae) from Australia

With 1 Figure and 1 Table

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Abstract: A new larval host plant, *Oxylobium aciculiferum* (F. Muell.) Benth. (Fabaceae), is recorded here for the Australian buprestid beetle, *Melobasis cupriceps* (Kirby) (Coleoptera: Buprestidae: Buprestinae). Its habitat is briefly recorded and aspects of the larval/pupal chambers are described. *Oxylobium aciculiferum* has not been recorded previously as a host (either larval or adult) for any other Australian Buprestidae and this is the first larval record from the genus *Oxylobium*. *Melobasis cupriceps* has been recorded previously as breeding in the branches of *Acacia longifolia* (Andr.) Willd. (Mimosaceae).

Zusammenfassung: Der Schmetterlingsblütler *Oxylobium aciculiferum* (F. Muell.) Benth. ist als neue Wirtspflanze der Larven des australischen Prachtkäfers *Melobasis cupriceps* (Kirby) (Col.: Buprestidae) festgestellt worden. Habitat und Aspekte der Puppenwiege des Käfers werden beschrieben. Weder *Oxylobium aciculiferum* noch eine andere Art der Gattung *Oxylobium* wurde bisher als Wirtspflanze für Larven oder Imagines der Buprestidenfauna gemeldet. Die Vermehrung von *M. cupriceps* war bisher nur in Zweigen von *Acacia longifolia* (Andr.) Willd. beobachtet worden.

Introduction

The genus *Melobasis* Laporte & Gory is comprised of at least 80 species found throughout Australia and some in Papua New Guinea (CARTER 1923, 1929). However, despite their presence in most terrestrial ecosystems in Australia, very little data have been published dealing with their biology, host plants and general behaviour. Recently, TURNER & HAWKESWOOD (1994) have provided new biological data for the poorly known species *Melobasis apicalis* Macleay from New South Wales. *Melobasis cupriceps* (Kirby) (Fig. 1 a) is a moderate-sized species, 12–15 mm long, with dorsal coloring of a yellowish-green with a ventral colour of darker bluish-green. The species occurs in New South Wales, Queensland, Victoria and Tasmania (CARTER 1929). Previously, FROGGATT (1895) recorded this species (as *M. iridescens* Laporte & Gory) breeding in branches of *Acacia longifolia* (Andr.) Willd. (Mimosaceae) at Rose Bay, Sydney and noted adults fed on *Viminaria denudata* Sm. (now known as *V. juncea* (Schrad.) Hoff., Fabaceae) (HAWKESWOOD & PETERSON 1982). WILLIAMS & WILLIAMS (1983) found *M. cupriceps* to be common during 14–16 December in the Royal National Park, Sydney Basin, New South Wales on *Viminaria juncea* which corroborates FROGGATT's earlier adult host plant record. Recent more important observations by the first author have increased knowledte about this poorly known insect and these data are recorded and discussed below for the first time.

Observations

On 9 March 1993, the first author, while accompanying Mr. Richard W. WELLS who was undertaking a vertebrate survey in the Olney State Forest (8 km SW of Cooranbong, 120 km N of Sydney, New South Wales) for the New South Wales Forestry Commission, observed

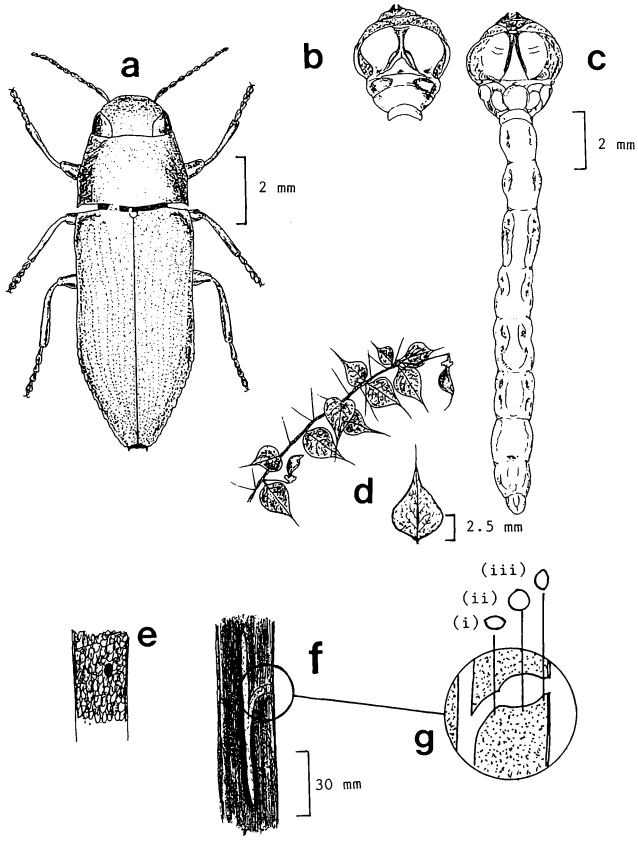

Fig. 1. *Melobasis cupriceps* (Kirby) and host plant. a: Dorsal aspect of adult; b: Head and prothorax of mature larva (ventral view); c: Mature larva (dorsal view); d: Larval host plant, *Oxylobium aciculiferum* (F. Muell.) Benth. (Fabaceae) stem and leaves; e: Exit hole in stem of *Oxylobium;* Lateral view of larval chamber showing exit tunnel; the larval chambers are single (i.e. not aggregated) and measure 6 – 10 cm in length, 5 mm wide and 2.5 mm high; the exit chamber subtends the larval chamber at about 45° and at about 2/3 the distance from the bottom of the larval chamber; g. Detail of the exit chamber and cross-sectional shapes of chamber at different positions from the main larval chamber. (Drawing: J. R. TURNER)

swellings on the stems of *Oxylobium aciculiferum* (F. Muell.) Benth. (Fabaceae). The plants varied from 2 – 4 metres in height and were located on the northern side of Prickly Ridge Road (approx. 33° 08′ S, 151° 23′ E). Some stem billets were collected from the site and a live larva and a long dead adult beetle were extracted from this material. Examination of the remains of the beetle and the exit holes on other swellings suggested that it may have been a *Meliboeithon* sp.

On 20 August 1994, the first author returned to the site and collected more billets from both live and dead shrubs for examination. Dissection of this material resulted in some interesting findings. In total, four species of Buprestidae were found to be using *Oxylobium aciculiferum* as a larval host. One of these species, *Melobasis cupriceps* (Kirby), the only species of the four that can be accurately identified at this stage to species, is the subject of the present paper. (The authors intend to publish separate papers on the other three species which appear to be (a) a *Meliboeithon* species which lives in swellings on the lower parts of the stem, (b) a species of *Melobasis,* the larvae of which apparently occur only in thin stems (i.e. 10 mm or less in

diameter) at the tops of the shrubs, and (c) a large species, possibly a *Melobasis* species, which produces an exit hole which is significantly larger than and on a different longitudinal axis to *M. cupriceps* and occurs only on the lower parts of the stems).

Prior to the dissection of one *O. aciculiferum* stem billet (which measured 35 mm in diameter), two exit holes were noticed about 120 mm apart. Each hole measured 4.0 mm wide by 2.5 mm high and was situated 90° to the longitudinal axis of the host plant (Fig. 1 e, f). During dissection of this billet, the larval chambers linked to the exit holes were revealed along with a third more recent larval chamber which contained an adult beetle that had died in the exit chamber (see fig. 1 g (i)), while enlarging section g (ii) of the chamber. The dead beetle was compared with specimens of *Melobasis* in the collection of the first author, but it was not able to be identified. On 22 August 1994, JRT visited the CSIRO Division of Entomology in Canberra and compared the specimen with those of various *Melobasis* species housed in the Australian National Insect Collection (ANIC). It was found to be identical to specimens of *Melobasis cupriceps* (Kirby) held in that collection.

Discussion

KIRBY (1818) first described *Melobasis cupriceps* (as *Buprestis cupriceps*) from "New Holland", but did not provide any biological data on the species. The first published biological data on the species appears to have been provided by FROGGATT (1895) who recorded the species breeding in *Acacia longifolia* (Andr.) Willd. (Mimosaceae), a common plant of the Sydney region, but his record has not been substantiated and it is possible that he made a misidentification. However, other Australian *Melobasis* species are known to be polyphagous in the larval stage (e.g. *Melobasis purpurascens* (Fabricius), HAWKESWOOD 1992; TURNER & HAWKESWOOD 1994; TURNER & HAWKESWOOD, this paper, Table 1), so the probability that *M. cupriceps* is also polyphagous cannot be ruled out entirely at this stage.

As regards adult host plants, FROGGATT (1895) noted that adults of *M. cupriceps* fed on flowers (?) of *Viminaria denudata* Sm. (now known correctly as *Viminaria juncea* (Schrad.) Hoff., Fabaceae) in the Sydney region. WILLIAMS & WILLIAMS (1983) recorded this species as common during mid December in the Royal National Park, south of Sydney, New South Wales (34° 10′ S, 151° 05′ E). These authors recorded *Viminaria juncea* as a food plant (thus verifying FROGGATT's earlier record), but do not indicate whether the beetle feeds on nectar, pollen, floral structures, leaves or all of these food sources. It is most likely that like *M. cuprifera* Laporte & Gory (HAWKESWOOD 1990), the adults feed exclusively on the petals of their Fabaceous hosts. HAWKESWOOD (1978) recorded *M. cupriceps* from the Blue Mountains, but this material is now regarded as belonging to *M. obscurella* Thomson (HAWKESWOOD 1991).

Oxylobium aciculiferum (F. Muell.) Benth. (Fig. 1 d) is an erect or ascending shrub growing to about 2 m high, with broad-ovate to narrow-ovate leaves measuring 10 – 12 mm long with a pungent, acuminate tip; the species flowers during summer and occurs in wet sclerophyll forests or in adjacent habitats. *Oxylobium aciculiferum* has not been recorded previously as a larval host plant for any Australian Buprestidae, and this is also the first published record of an *Oxylobium* species as a larval host for the Australian buprestid fauna. Judging by our investigations so far, *O. aciculiferum* is an important larval host plant for buprestids which deserves further study. The Fabaceae are proving to be important larval and adult food plants for Australian Buprestidae. Other Fabaceae larval hosts for *Melobasis* species include *Pultenaea villosa* Willd. for *M. cuprifera* Laporte & Gory (HAWKESWOOD 1988, 1990; TURNER & HAWKESWOOD 1994) and *Bossiaea rhombifolia* Sieb. ex DC. for *M. apicalis* Macleay (TURNER & HAWKESWOOD 1994). *Melobasis* as a genus is polyphagous but *Acacia* species appear to be the preferred larval hosts, with at least six *Acacia* species being recorded for three *Melobasis* species (Table 1, this paper). The adults are also known to feed on *Acacia* leaves (e.g. HAWKESWOOD 1978; WILLIAMS & WILLIAMS 1983).

Table 1. Summary of the larval host plants and references for species of *Melobasis* from Australia (* = introduced plant species)

Species of buprestid	Host plant		Reference
	Species	Family	
Melobasis apicalis Macleay	*Bossiaea rhombifolia* Sieb. ex DC.	Fabaceae	TURNER & HAWKESWOOD (1994)
Melobasis cupriceps (Kirby)	*Acacia longifolia* (Andr.) Willd.	Mimosaceae	FROGGATT (1895); HAWKESWOOD & PETERSON (1982)
	Oxylobium aciculiferum (F. Muell.) Benth.	Fabaceae	TURNER & HAWKESWOOD (this paper)
Melobasis cuprifera Laporte & Gory	*Pultenaea villosa* Willd.	Fabaceae	HAWKESWOOD (1988, 1990)
Melobasis hypocrita Erichson	*Nothofagus moorei* (F. Muell.) Krasser	Fagaceae	WILLIAMS (1985)
	Doryphora sassafras Endl.	Monimiaceae	WILLIAMS (1985)
Melobasis purpurascens (Fabricius)	*Acacia longifolia* (Andr.) Willd.	Mimosaceae	FROGGATT (1895); HAWKESWOOD & PETERSON (1982); HAWKESWOOD (1992)
	Flindersia australis R. Br.	Flindersiaceae	HAWKESWOOD (1986, 1992)
	Acacia dealbata Link	Mimosaceae	BASHFORD (1991); HAWKESWOOD (1992)
	Acacia concurrens Pedley	Mimosaceae	HAWKESWOOD (1992)
	Acacia irrorata Sieb. ex Spreng.	Mimosaceae	HAWKESWOOD (1992)
	Acacia melanoxylon R. Br.	Mimosaceae	HAWKESWOOD (1992)
	Acacia sophorae (Labill.) R. Br.	Mimosaceae	HAWKESWOOD (1992)
	Aegiceras corniculatum (L.) Blanco	Myrsinaceae	HAWKESWOOD (1992)
	Clerodendrum floribundum R. Br.	Verbenaceae	HAWKESWOOD (1992)
	Excoecaria agallocha L.	Euphorbiaceae	HAWKESWOOD (1992)
	**Citrus limonia* Osbeck	Rutaceae	HAWKESWOOD (1992)
	**Citrus sinensis* (L.) Osbeck	Rutaceae	HAWKESWOOD (1992)
Melobasis sexplagiata Laporte & Gory	*Eucalyptus camaldulensis* Dehn.	Myrtaceae	TEPPER (1887)[1])
	Eucalyptus rudis Endl.	Myrtaceae	MCMILLAN (1950a, b); HAWKESWOOD & PETERSON (1982)
Melobasis vertebralis Carter	*Acacia leiocalyx* (Domin) Pedley	Mimosaceae	VOLKOVITSH & HAWKESWOOD (unpub. data)

[1]) TEPPER (1887) listed the host plant of *M. sexplagiata* Laporte & Gory as *Eucalyptus rostrata* Schlect. but this name is a synonym of the widespread and variable species *E. camaldulensis* Dehn. TEPPER's paper has been overlooked by all subsequent authors on the family Buprestitidae.

The larval chamber of *M. cupriceps* consists of a long flat central chamber measuring 6 – 10 cm long, with an exit chamber sloping upwards and away from the central chamber at an angle of 45° and from about 2/3 of the distance up the chamber (Fig. 1 f, g). The adult beetle appears to enlarge the exit chamber in the final few millimetres to enable it to emerge sideways. The dead beetle was in the process of undertaking this when it died, since the enlarged section was clearly visible (Fig. 1 g, iii). All exit holes (Fig. 1 e) were at 90° to the longitudinal axis of the host wood. The larval chambers are single and are not grouped together (i.e. aggregated) as found in some other species of *Melobasis*.

The authors are actively investigating the life-histories and general biology and behaviour of Australian and New Guinea Buprestidae since little has been previously recorded and these results will be reported in due course.

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