

A note on the biology and host plant of *Cisseis* sp. near *C. nitidiventris* Carter (Coleoptera: Buprestidae) from Australia

With 1 Figure and 1 Table

J. R. TURNER and T. J. HAWKESWOOD

Abstract: The Australian buprestid beetle *Cisseis* sp. near *C. nitidiventris* Carter (Coleoptera: Buprestidae: Buprestinae: Coraebini) is first recorded here as developing in gall-like swellings on the primary roots of the native shrubby pea-plant *Dillwynia retorta* (Wendl.) Druce (Fabaceae) in New South Wales. No other larval host records are presently known for this buprestid. Data on the larval hosts of other *Cisseis* species are provided and compared with that of *C. sp.* near *C. nitidiventris* Carter.

Zusammenfassung: Für den australischen Prachtkäfer *Cisseis* spec. cf. *C. nitidiventris* Carter (Col.: Buprestidae: Coraebini) wird hier erstmalig die Entwicklung in Schwellungen der Wurzeln des strauchartigen Schmetterlingsblütlers *Dillwynia retorta* (Wendl.) Druce in Neu-Süd-Wales nachgewiesen. Andere Funde von Wirtspflanzen der Larven dieses Buprestiden sind bisher nicht bekannt. Daten über die Wirtspflanzen der Larven anderer *Cisseis*-Arten werden vorgestellt und mit denen von *C. spec.* cf. *nitidiventris* verglichen.

Introduction

The genus *Cisseis* Laporte & Gory contains at least 60 species of dull to bright metallic, plain or spotted, small to medium sized beetles occurring in Australia and Papua New Guinea (CARTER 1923, 1929). Most members of the genus are difficult to identify from previous studies and museum specimens are often incorrectly labelled. The genus is badly in need of a modern revision. The adults of *Cisseis* species are mostly foliage feeders on *Acacia* (Mimosaceae) (e.g. FROGGATT 1895; CARTER 1923; HAWKESWOOD 1978, 1987, 1992; WILLIAMS & WILLIAMS 1983), but some species have been reported as frequenting and feeding on flowers of various plants, especially Fabaceae (e.g. TEPPER 1887; HAWKESWOOD 1978, 1990; HAWKESWOOD & PETERSON 1982). *Cisseis nitidiventris* Carter is a poorly known species from New South Wales (CARTER 1934). Almost nothing has been recorded on its biology and host plants. The only previously published data that we have been able to locate for the species is the record of WILLIAMS & WILLIAMS (1983) who recorded *C. nitidiventris* adults on the flowers (?) of *Leptospermum* species (i.e. *Leptospermum flavescens* Sm. and *Leptospermum* sp.) (Myrtaceae) in the Sydney Basin of New South Wales. Recent important observations by the first author have revealed that a *Cisseis* species, very close to *C. nitidiventris* develops in the base of the stems or in the roots of the pea plant *Dillwynia retorta* (Wendl.) Druce (Fabaceae). These observations are outlined below. Illustrations of the roots, swellings and adult is provided in Fig. 1.

Observations

On 4 July 1994, the first author undertook a survey of an area of heathland located on a hillside on the western side of Warrys Road, Hill End, New South Wales (c. 33°02' S, 149°25' E). The area examined was situated near the top of the hill and measured approx. 80 m long by 10 m wide. A thick understorey of *Cassinia arcuata* R. Br. (Asteraceae) dominated the lower part of the hill and formed the lower boundary of the area surveyed. The

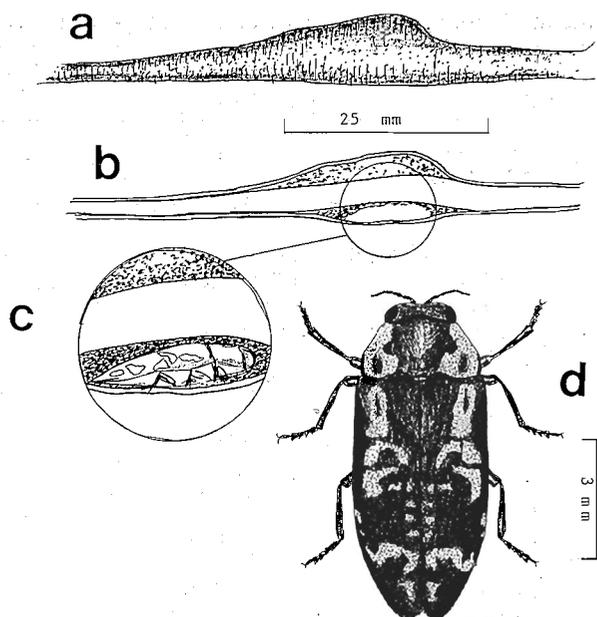


Fig. 1. *Cisseis* sp. near *C. nitidiventris* Carter from the roots of *Dillwynia retorta* (Wendl.) Druce (Fabaceae) at Hill End, New South Wales. a: Root of *D. retorta* showing gall-like swelling associated with the larval/pupal chamber; b: Section through swelling showing larval/pupal chamber; c: Enlarged view of larval/pupal chamber showing adult as found when the chamber was exposed; d: Dorsal habitus of adult. (Drawing: J. R. TURNER).

area itself was dominated by *Pultenaea subternata* Williamson and *Dillwynia retorta* (Wendl.) Druce var. *phylicoides* (both Fabaceae). A number of branches and stem billets (some with roots attached) were collected from both species of pea for later examination. During the dissection of the *D. retorta* material, a single dead adult of *Cisseis* sp. near *C. nitidiventris* was found in the centre and at the base of a stem; the elytra of the beetle were malformed but the colours and markings were readily identifiable. A second adult was found during the examination of another *D. retorta* plant; in this case, the beetle was alive and situated within a small bulge on a primary root. The larval chamber measured 13 mm long by 3.5 mm high and was situated approx. 40 mm away from the main stem and about 20 mm below ground level. When the larval chamber was opened, it was found that the adult was located in a chamber in the bottom of the root with its head facing towards the main stem with its legs and tarsi pointing downwards. The live specimen in good condition was compared with a group of *Cisseis* species in the first author's collection which had been identified in 1984 by Dr. B. LEVEY of the British Museum of Natural History. The adult from *D. retorta* from Hill End was similar to but not identical to a species identified by Levey as *Cisseis nitidiventris* Carter, a somewhat variable species as indicated by the series of adults in the first author's collection collected from coastal areas in the Sydney district. The Hill End *Cisseis* sp. is most likely a new, undescribed species which has evolved from *C. nitidiventris* in an isolated area which is producing speciation in the local buprestid fauna. However, further observations and field collections are needed to be undertaken before its specific status can be validated.

Discussion

Dillwynia retorta (Wendl.) Druce (Fabaceae) is the first recorded larval host plant for *C. sp.* near *C. nitidiventris* Carter. Although the presently available data are rather limited, it appears that larvae of this species may form gall-like swellings on the primary roots of the

Table 1. Summary of the larval host plants and references for some species of *Cisseis* from Australia

Buprestid species	Larval host plant		References
	Species	Family	
<i>Cisseis acuducta</i> (Kirby)	<i>Dillwynia retorta</i> (Wendl.) Druce	Fabaceae	FROGGATT (1892) ¹
<i>Cisseis duodecimmaculata</i> (Fabricius)	<i>Xanthorrhoea</i> spp.	Xanthorrhoeaceae	CARTER (1923)
<i>Cisseis leucosticta</i> (Kirby)	<i>Acacia pycnantha</i> Benth.	Mimosaceae	TEPPER (1887)
	<i>Acacia decurrens</i> (Wendl.) Willd.	Mimosaceae	GALLARD (1916)
<i>Cisseis maculata</i> Laporte & Gory	<i>Acacia longifolia</i> (Andr.) Willd.	Mimosaceae	FROGGATT (1895)
	<i>Acacia decurrens</i> (Wendl.) Willd.	Mimosaceae	GALLARD (1916) ²
<i>Cisseis</i> sp. near <i>C. nitidiventris</i> Carter	<i>Dillwynia retorta</i> (Wendl.) Druce	Fabaceae	TURNER & HAWKESWOOD (this paper)
<i>Cisseis scabrosula</i> Kerremans	<i>Acacia longifolia</i> (Andr.) Willd.	Mimosaceae	VAN DEN BERG (1982); WEBB (1988)
	<i>Acacia floribunda</i> (Vent.) Willd.	Mimosaceae	WEBB (1993)
<i>Cisseis semiscabrosa</i> Thomson	<i>Acacia longifolia</i> (Andr.) Willd.	Mimosaceae	FROGGATT (1895) ³

¹) FROGGATT (1892) cited this species of buprestid as *Ethon marmoreum* Laporte & Gory, a synonym of *Cisseis acuducta* (Kirby) according to CARTER (1923, 1929).

²) GALLARD (1916) through a misprint cited this species of buprestid as *Bisseis similis*, which should be *Cisseis similis*, a synonym of *Cisseis maculata* Laporte & Gory, according to CARTER (1923, 1929).

³) FROGGATT (1895) listed this species of buprestid with a question mark and HAWKESWOOD & PETERSON (1982) suggested that FROGGATT was referring to *Cisseis scabrosula* Kerremans. However, reexamination of FROGGATT's paper has shown that the species referred to could not be *C. scabrosula*. CARTER (1923) did not key *C. semiscabrosa* Thomson as he had not seen the type. It is probable that when the genus *Cisseis* is fully revised *C. semiscabrosa* will be found to be a valid species.

host plant, although these are not typical of the swollen, well-differentiated galls of the other Australian genera of *Ethon* (see HAWKESWOOD & TURNER 1992 and reference cited therein) or *Dinocephalia* (TURNER & HAWKESWOOD 1994).

FROGGATT (1892) recorded *Cisseis acuducta* (Kirby) as breeding in the galls on the roots of *D. retorta* (as *D. ericifolia* Sm.) in the Sydney area (see Table 1). Although this record has never been confirmed, it is probable that *C. acuducta* and *C. sp. near C. nitidiventris* larvae have a similar life-history underground in the roots of *D. retorta*. Other *Cisseis* species such as *C. leucosticta* (Kirby), *C. maculata* Laporte & Gory, *C. scabrosula* Kerremans and *C. semiscabrosa* Thomson have been recorded as developing in the branches of their hosts and apparently do not form gall-like swellings (see references in Table 1, this paper). [CARTER (1923) recorded *C. duodecimmaculata* (Fabricius) as breeding in and frequenting the foliage of *Xanthorrhoea* plants, but this larval host record has also not been confirmed in recent times (see also Table 1, this paper)]. So it is apparent that not all *Cisseis* species are root-feeders in the larval stage and that many display typical buprestid life-cycles in the stems of their hosts.

Two species of Buprestidae larvae (one presently unidentified) have now been recorded by the first author from *D. retorta* at Hill End and further examination of the large stands of *Dillwynia* and *Pultenaea* in that area is expected to result in the acquisition of more species.

Acknowledgements

We wish to thank Dr. Brian LEVEY for the identification of various Buprestidae in the collection of the first author.

References

- CARTER, H. J. (1923). Revision of the genera *Ethon*, *Cisseis* and their allies (Buprestidae). — Proceedings of the Linnean Society of New South Wales, **48**, 159–176.
- (1929). A check list of the Australian Buprestidae. — Australian Zoologist, **5**, 265–304.
- (1934). Australian and New Guinea Coleoptera. Notes and new species. No. 3. — Proceedings of the Linnean Society of New South Wales, **59**, 252–261.
- FROGGATT, W. W. (1892). Gall-making buprestids. — Proceedings of the Linnean Society of New South Wales, **7**, 323–326.
- (1895). Life-histories of Australian Coleoptera. Part III. — Proceedings of the Linnean Society of New South Wales, **20**, 325–336.
- GALLARD, L. (1916). List of insects associated with *Acacia decurrens*. — Australian Naturalist, **3**, 112–114.
- HAWKESWOOD, T. J. (1978). Observations on some Buprestidae (Coleoptera) from the Blue Mountains, N.S.W. — Australian Zoologist, **19**, 257–275.
- (1987). Beetles of Australia. — Angus & Robertson Publishers, Sydney, 248 pp.
- (1990). A survey of the jewel beetles (Coleoptera: Buprestidae) from the Townsville district, northern Queensland, Australia. — Giornale Italiano di Entomologia, **5**, 23–30.
- (1992). A note on *Cisseis laticollis* Carter (Coleoptera: Buprestidae) from Queensland. — Victorian Entomologist, **22**, 111.
- HAWKESWOOD, T. T. and PETERSON, M. (1982). A review of larval host records for Australian jewel beetles (Coleoptera: Buprestidae). — Victorian Naturalist, **99**, 240–251.
- HAWKESWOOD, T. J. and TURNER, J. R. (1992). Review of the biology and host-plants of *Ethon fissiceps* (Kirby) and other *Ethon* species (Coleoptera: Buprestidae). — Giornale Italiano di Entomologia, **6**, 169–174.
- TEPPER, J. G. O. (1887). Common native insects of South Australia. A popular guide to South Australian Entomology. Part. 1. Coleoptera or beetles. — E. S. Wigg and Son, Adelaide, 46 pp.
- TURNER, J. R. and HAWKESWOOD, T. J. (1994). Observations on the biology and host plants of *Dinocephalia cyaneipennis* (Blackburn) (Coleoptera: Buprestidae) from New South Wales, Australia. — Giornale Italiano di Entomologia, **7**: 1–10.
- VAN DEN BERG, M. A. (1982). Coleoptera attacking *Acacia dealbata* Link., *Acacia decurrens* Willd., *Acacia longifolia* (Andr.) Willd., *Acacia mearnsii* De Wild. and *Acacia melanoxylon* R. Br. in Australia. — Phytophylactica, **14**, 51–55.
- WEBB, G. A. (1988). Some foliage insects of *Racosperma longifolia* (Andr.) Pedley (sic) (Mimosaceae) in New South Wales. — Victorian Naturalist, **105**, 88–91.
- (1993). Plant associations of some Australian jewel beetles (Coleoptera: Buprestidae: Agrilinae). — Victorian Naturalist, **110**, 160–162.
- WILLIAMS, G. A. and WILLIAMS, T. (1983). A list of the Buprestidae (Coleoptera) of the Sydney Basin, New South Wales, with adult food plant records and biological notes on food plant associations. — Australian Entomological Magazine, **9**, 81–93.

Received on 30 September, 1994

J. R. TURNER, 117 Derby Street, Penrith, New South Wales, 2750, Australia

T. J. HAWKESWOOD, c/- North Star Caravan Resort, Coast Road, Hastings Point, New South Wales, 2489, Australia