

OBSERVATIONS OF THE MIENA JEWEL BEETLE *CASTIARINA INSCULPTA* (CARTER, 1934) IN THE SUMMER OF 2012–13

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ABSTRACT

The Miena jewel beetle *Castiarina insculpta* (Carter, 1934) is classified as endangered on the Tasmanian *Threatened Species Protection Act 1995* and has been infrequently recorded since its re-discovery in 2004. Multiple searches during February 2013 resulted in observations of large numbers of live individuals of the species at several sites on Tasmania's Central Plateau. These finds resulted in a moderate range extension, recognition of *Ozothamnus hookeri* Sond. as the species' host plant, and increased life history knowledge of the beetle. Only further searching will determine whether the species was unusually abundant in 2012–13, or whether it had been overlooked in previous years.

INTRODUCTION & PAST RECORDS

The Tasmanian jewel beetle fauna includes at least 50 species, several of which have poorly known distributions or have been seldom recorded (Cowie 2001; Grove & Yaxley 2004). One of the most diverse genera, *Castiarina* Gory and Laporte 1838, includes several apparently endemic species, some of which are confined to high altitudes and are poorly known (Barker 2006).

The Miena jewel beetle, *Castiarina insculpta* (Carter, 1934) is a striking species recognisable by its bright metallic blue-green colour with yellow elytral patches and distinctive inwardly curved spines at the posterior elytral margins. The original description referred only to the species' collection by Critchley Parker in the "Great Lake district" and to the holotype specimen

(which is held in the collections of the British Museum of Natural History). A second specimen, held by the South Australian Museum, was collected in 1965. However this record was overlooked, and in the absence of further records despite some searching, the species was prematurely classified as presumed extinct on the inaugural schedules of the Tasmanian *Threatened Species Protection Act 1995* (Bryant & Jackson 1999).

The species was re-discovered in 2004 when two specimens were collected (Smith et al. 2004). In 2008 and 2010 there were a further two confirmed collections of single dead specimens. The records between 2004 and 2010 were made in February with the exception of one dead specimen collected in mid-March. Notably, the records typically resulted from accidental collection by members of the general public

rather than naturalists specifically searching for the species, and all specimens collected were female. Table 1 summarises the pre-2013 collecting history.

The discovery of a dead specimen at Lake Augusta by Tasmanian Field Naturalists Club member James Wood in 2008 resulted

in great interest in the species among members of the Club. Club outings organised by DH to search for the beetle were conducted on 18 January 2009 and 29 January 2012 without success although the latter resulted in two records of *Castiarina rudis* (Carter, 1934), a seldom-recorded and apparently rare species.

Table 1. *Castiarina insculpta* sites where records occurred prior to 2013

Site	Location	Tenure	1:25000 mapsheet	Year(s) recorded	Abundance
1	Great Lake ¹	Unknown	Miena	pre-1934	1
2	Miena ²	Unknown	Miena	1965	1
3	Miena ³	Private property	Miena	2004	1 (dead)
4	Little Pine Lagoon or Lake Fergus ⁴	Public Reserve or Central Plateau Conservation Area	Miena	2004	1
5	Lake Augusta near Carter Lakes	Central Plateau Conservation Area	Ada	2008, 2013	1 (dead), 2
6	Lake Augusta or Great Lake (Brandum Bay) ⁵	Unknown	Ada or Miena	2010, 2013	1 (dead), moderate ⁶

¹Carter (1934) described the Miena Jewel Beetle from a specimen collected by Critchley Parker from the “Great Lake district” (holotype, Natural History Museum, London) but the date is not stated; ²single specimen, attributed to K. LeSouef, collected from the Miena area and held at the South Australian Museum (Cowie 2001; Smith et al. 2004); ³the “re-discovery” specimen “collected” in the back of a ute, having been driven through Miena; ⁴reported in Smith et al. (2004), based on a specimen from an angler, who had visited the Little Pine Lagoon or Lake Fergus area; ⁵reported by an angler who found a dead beetle in the bottom of his fishing boat after angling at Lake Augusta and Brandum Bay (Great Lake) on the same day (Tabor & Bowden 2010); ⁶moderate abundance refers to Brandum Bay

THE 2013 RECORDS

A review of record dates conducted by KB suggested we may have been searching too early in the year. Thus in 2013, the first search by the Club (this trip including KB, AT, DH & CR) did not occur until 3 February. A follow-up expedition on 6 February produced more specimens and records, and this was followed by multiple successful searches in other locations by KR and CS and, independently, by CR as well as a trip by James Wood.

The first sighting during the 2013 search occurred around the junction of the Lake Highway and Lake Augusta Road. The site had been thoroughly searched by the Club during the late January 2012 trip, with no jewel beetles of any species observed, but during the February 2013 visit the first specimen of *Castiarina insculpta* was found within a few minutes. More soon followed. In all about 25 specimens were observed by about a dozen searchers over a period of about 70 minutes. Beetles were active on *Ozothamnus hookeri* (scaly

everlasting bush) blossom (Plates 1-3) or flying between the shrubs. In two cases, loose groups of several specimens were observed together on vegetation. Other flowering shrubs in the area including other species of *Ozothamnus* were not generally visited by the beetles. One live specimen was found entangled in a spider web amongst *Ozothamnus hookeri* foliage (CR). On 10 February at the same site, a coupled pair was photographed on the flowerhead of an *Ozothamnus hookeri*.



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Plate 1. *Castiarina insculpta* on flowerhead of *Ozothamnus hookeri*



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Plate 2. *Castiarina insculpta* feeding on *Ozothamnus hookeri*



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Plate 3. Close-up of *Castiarina insculpta* feeding on *Ozothamnus hookeri*

Searches at other sites around the western side of Great Lake and around Lake Augusta over following weeks were usually successful, except in conditions of unsuitable weather (including high wind), provided that *Ozothamnus hookeri* was present in significant quantities. Weather conditions did not need to be unusually warm for the beetle to be found. Numbers varied considerably among sites. Vegetation types ranged from alpine moorland to subalpine eucalypt forest, provided that the host plant was present.

Surveys conducted along the Marlborough Highway identified significant stands of *Ozothamnus hookeri* and presence of *Castiarina insculpta* as far as the Little Pine Lagoon Dam wall. At Skittleball Plains amid an ocean of *Ozothamnus hookeri* with many attendant beetles, a pair of *Castiarina insculpta* opportunely mated on a researcher's hand (Plate 4). On a subsequent search conducted in late February, CS and KR extended the species' range to Tods Corner where a significant area of *Ozothamnus hookeri* exists across Ellis Plains. A further sighting was made beside the Lake Highway 2 km north of the Tods Corner Road turnoff (CR).

Additional searches of suitable habitat in the vicinity of Arthurs Lake, Penstock Lagoon, Cramps Bay and on Poatina Road near Jonah Bay Road (KR & CS) failed to locate *Castiarina insculpta*. However, on 2 March, an empty pronotal segment of an unidentified *Castiarina* species, possibly *Castiarina insculpta*, was found in a spider web amongst *Ozothamnus hookeri* foliage beside Poatina Road at its junction with Poatina Intake Road (CR).

The site where the beetles were most readily observable on 6 February was around the junction of Highland Lakes Road and Lake Augusta Road. It was here that a female was observed (by SG & CB) behaving rather differently after alighting

near the tip of a flowering *Ozothamnus hookeri* plant. Most individuals observed up to that point had tended to remain feeding amongst the flowers, or to take to the wing again soon after alighting. Instead, this female began a purposeful rearwards crawl down the woody stem of the plant. As the stem became thicker, she increasingly probed fissures in the bark with the tip of her abdomen. She continued this behaviour for several minutes, as several of us took photos. On at least two occasions her probings seemed to have found the right spot for oviposition, as her abdomen remained in position for perhaps ten or fifteen seconds (Plate 5). From this behaviour, and from finding *Castiarina*-sized and shaped emergence-holes in similar stems nearby (Plate 6), we conclude that *Ozothamnus hookeri* is a (the?) larval host-plant for *Castiarina insculpta*. A more detailed paper on the species' life history is currently being prepared by CS & KR.

Over this survey period, CS & KR recorded two additional *Castiarina* species, *Castiarina flavopicta* and *Castiarina wilsoni*. Both were found on *Ozothamnus ericifolia* (heathy everlastingbush) blossom. KB collected one specimen of *Castiarina virginea* from a spider's web. Table 2 summarises the 2012–2013 collecting history of *Castiarina insculpta*.

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Plate 4. Mating pair of *Castiarina insculpta*

Table 2. 2013 records of *Castiarina insculpta*

Site	Location	Tenure	1:25000 mapsheet	Number recorded
1	Liawenee, Lake Augusta Road	Private property Central Plateau Conservation Area	Split Rock	> 60
2	Mickeys Creek	Central Plateau Conservation Area	Breona	1
3	Pine Tree Rivulet, Great Lake	HEC	Breona	10
4	north of Liawenee	Rainbow Point Conservation Area	Split Rock	12
5	Lake Augusta Road	Private property	Split Rock	1
6	Little Pine Lagoon, southwestern end	Little Pine Lagoon Lakeside Reserve	Monpeelyata	5
7	Marlborough Highway, Little Pine Lagoon	Private property	Miena	8
8	Tods Corner	Private property	Arthurs Lake	15
9	Camerons Lagoon	Private property Central Plateau Conservation Area	Miena	2

DISCUSSION

The principal question raised by finding *Castiarina insculpta* in such numbers is why there have not been similar finds before. Possible hypotheses include:

- (i) that the species is often this common, or nearly so, and has been overlooked because incorrect tree species were targeted as prospective host-plants (for instance, species of *Leptospermum*, visited by many other buprestids);
- (ii) that this was a season of unusual plenty for *Castiarina insculpta* and it is normally genuinely scarce; or
- (iii) some previous surveys were undertaken outside of the flight period of *Castiarina insculpta* and/or the flowering period of *Ozothamnus hookeri* (see Plate 7 for image of plant).



Plate 5. Ovipositing female *Castiarina insculpta*

Attempts to repeat our results during following summers will be necessary to establish which of these (if any) is correct.

Concerning (ii), the summer of 2013 was considered unusually warm, with Hobart's hottest ever day recorded on 4 January and many other hot days at sea level. Bureau of Meteorology records, however, show that average temperatures at Liawenee through 2012–13 were just slightly warmer than normal, with most months up to around 1 degree per day warmer than average. This seemingly minor temperature difference may in fact have a major impact on a species adapted to alpine conditions.

No live specimens were observed by CR during searching on 2 March.



Plate 6. Putative emergence hole of *Castiarina insculpta*

CONSERVATION STATUS

The Miena jewel beetle was listed in 1995 as presumed extinct on the Tasmanian *Threatened Species Protection Act 1995*, on the basis that no individuals had been collected in the wild since at least 1934 (the 1965 collection only came to light in 2004). Following the “re-discovery” of the species (Smith et al. 2004), it was downgraded to endangered. The beetle was considered to meet criterion D in the guidelines used by the Scientific Advisory Committee to

inform recommendations on listing, specifically D1 (total population estimated to number fewer than 250 mature individuals) and D2 (total population with an area of occupancy less than 0.01 km² (1 hectare), and typically in five or fewer locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of becoming extinct within a very short time period).

Following the recent discoveries of robust subpopulations the listing has been reviewed. The species still qualifies for listing as endangered, as it is possible that it meets criterion C, specifically C2b (total population estimated to be fewer than 2,500 individuals in years of lowest abundance with extreme fluctuations in number of mature individuals). This could apply if 2013 was an unusually good year for the species and it was normally much less common.

However, if further surveying demonstrates that there are not extreme fluctuations in the number of mature individuals, or that the total population in years of lowest abundance exceeds 2,500 individuals, then the species' endangered status will need to be reassessed.

We recommend that further seasonal surveys to assess the relative abundance of the species be conducted to inform future consideration of downlisting or delisting *Castiarina insculpta*.

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Plate 7. *Ozothamnus hookeri*