

New collection of *Brounia thoracica* (Coleoptera: Chelonariidae)

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Introduction

Among the 10,000 or so New Zealand beetles (Leschen *et al.* 2003), there are many species considered rare or uncommonly collected, whose biological status is largely unknown. One beetle, *Brounia thoracica* Sharp (Fig. 1), has been keenly sought by collectors and here we report the serendipitous collection of a single male specimen on Great Barrier Island, bringing the total number of known specimens to seven.

Is *Brounia thoracica* rare?

For any group of organisms there are species or populations that are numerically rare or uncommon. Whether or not these rare taxa are on the road to extinction or have unique habits that make them elusive requires detailed study. Nevertheless, by their intrinsic scientific and natural history value, rare invertebrate species are of importance to biologists, amateur collectors, the public, and even the Department of Conservation. *Brounia thoracica* is, therefore, intrinsically important because only seven specimens are known in the world, with one specimen collected every 20 years or so on average. Is it rare? Who knows, but it is certainly rarely found and important to us in New Zealand.

The known geographic distribution follows the curve of the North Island's eastern coastline from Whangarei to East Cape. Lawrence *et al.* (1999) stated that it is found in both North and South Islands, but we are unaware of any specimens from the latter. Collection information of known specimens is as follows:

♀, Whangarei, E.R. Fairburn Insect Collection, Whangarei Museum.

♂, Hen I., E.R. Fairburn Insect Collection, Whangarei Museum.

♂, Great Barrier I., 18 Dec 2003, Auckland War Memorial Museum.

♀, Paparoa [*sic*] (now known as Howick, Auckland), New Zealand Broun Collection, Natural History Museum, London.

♂, Tairua, New Zealand Broun Collection, Natural History Museum, London.

♂, Hicks Bay, East Cape, Nov 1992 – Feb 1993, New Zealand Arthropod Collection, Landcare Research, Auckland.

♂, no locality, Hutton Collection, Canterbury Museum, Christchurch.

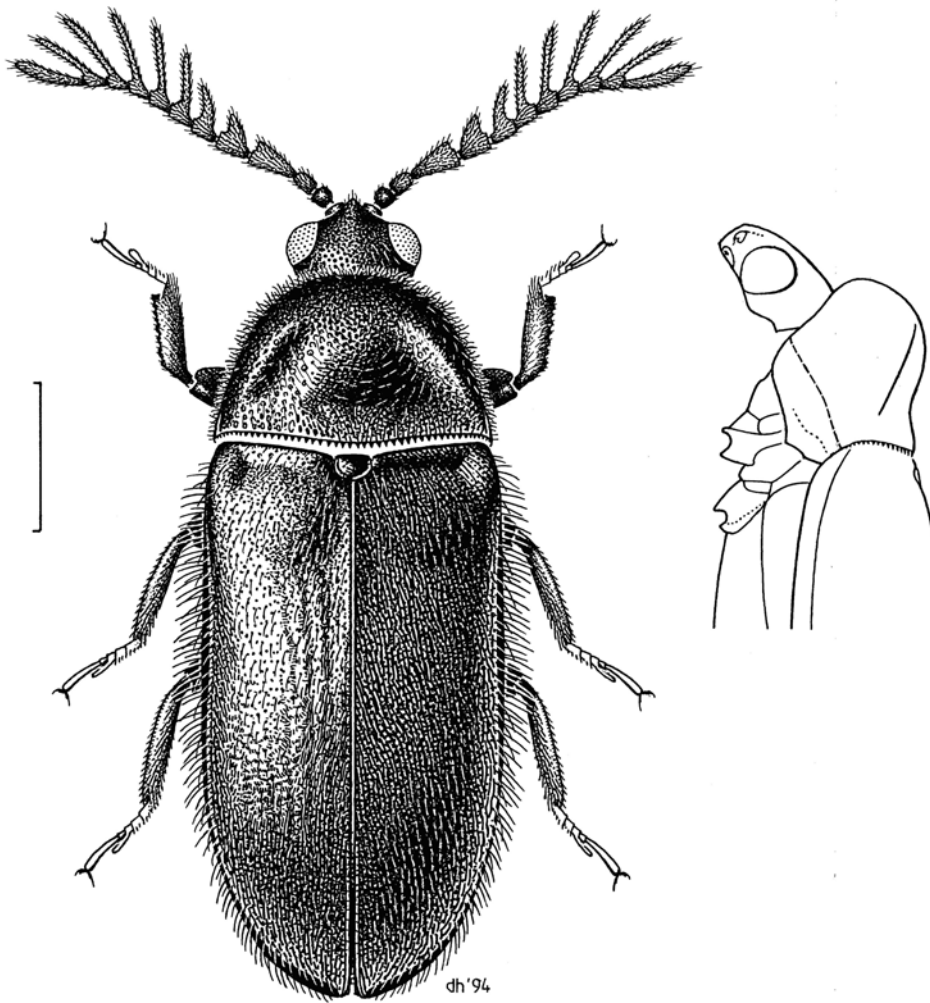


Figure 1. *Brounia thoracica* Sharp, male. The female antenna is not pectinate. The scale bar represents 1mm.

Taxonomic history and phylogenetic placement of *Brounia*

Way back before John Dugdale, and possibly Willy Kushel, were born, *B. thoracica* was described by David Sharp in the 1870s. Sharp, a rather lean gentleman from Glasgow, was one of the most important coleopterists and natural historians of his time, the Victorian era. He left a remarkable legacy, including taxonomic names for countless insects (mainly beetles, including numerous New Zealand taxa), the Zoological Record (he was cofounder and also Editor) and a massive library which is currently under the management of Landcare Research. Two New Zealand specimens labelled “*Drilus ?atrocaeruleus*” were sent to the British Museum of Natural History (BMNH) by Thomas Broun to be studied by Sharp (1876). One specimen was “mutilated and brittle” and the other we presume is lost. One of these may have been disarticulated by Roy A. Crowson (J. Lawrence, *personal communication*), but has not been examined recently. Sharp stated, “it is one of the most remarkable beetles yet discovered in New Zealand” and “to force any of these interesting insects into the ordinary families of Coleoptera, is to refuse to recognise them for what they really are – isolated anomalies, whose relationships, even *inter se*, are highly problematical.” Sharp thought his new genus *Brounia* was “undoubtedly allied to *Chelonarium*” and it is now placed along with two other genera in the family Chelonariidae in the series Elateriformia.

There are over 200 described species in the family, with undoubtedly more to be described in tropical regions. The genus *Brounia* is restricted to New Zealand (Klimaszewski & Watt 1997), while *Pseudochelonarium* occurs in India, Southeast Asia and New Guinea (Paulus 1969) and *Chelonarium* is mainly found in the Neotropics, but also occurs in Queensland (Lawrence & Britton 1991, Lawrence and Newton 1995). The family is monophyletic based on several adult characters (Beutel & Leschen 2004), including the strongly declined head, the reduced condition of labrum and mandibles, the partly reduced prosternum, and the membranous lobes of tarsomeres III. *Brounia* is basal to the more derived sister-pair *Pseudochelonarium* + *Chelonarium*, lacking many of the synapomorphies shared in the latter.

The precise systematic position of the family is unclear (Lawrence 1987, Lawrence *et al.* 1995, Beutel 1995) but the latest study by Costa *et al.* (1999) placed Chelonariidae within Ptilodactylidae, though no taxonomic changes were made. Indeed, in general appearance *Brounia* is more similar to a ptilodactylid than to its confamilials.

Collecting and biology of *Brounia thoracica*

Whilst collecting on a dry, sunny day (18 December 2003) near the Kaiarara Stream close to Port Fitzroy, Great Barrier Island, JE made a few delicate sweeps of a fairly

large flowering mahoe (*Melicytus ramiflorus*). JE carefully brought the net down for closer inspection and noted a black and somewhat bluish beetle resting comfortably along the inside rim of the net. RL took a brief look at the find, commanded JE to grab the specimen between his fingers while he scrambled for a vial. RL was then speechless for some time before expressing himself extremely colourfully (a vivid shade of blue) and volubly. After a quick look with a 20x handlens to confirm the unbelievable, RL pronounced, “that’s *Brounia thoracica*!”

Immediately following the pronouncement, JE began sweeping the mahoe for other specimens. Other flowering mahoe along the road to Port Fitzroy were examined using the successful JE sweeping method (Fig. 2) and the failed RL pan collecting method (Fig. 3) but sadly there were none.

This is the first tangible snippet of biological information we have for *B. thoracica*. No biological information is available for the remaining specimens, apart from the previously most recent collection of a specimen in a Malaise trap serviced by Rosa Henderson and set in a cattle-browsed forest at Hicks Bay, north of Te Araroa (see Klimaszewski & Watt 1997). It is quite likely that the species is found in very poor habitats, since there is nothing at all remarkable about a cattle-browsed forest, nor the lowland kanuka and coastal bush on Great Barrier except that you can find *B. thoracica* in it. We postulate from the new record that the adults of *B. thoracica* may be feeding on pollen and/or nectar, an activity indulged in by a wide variety of adult beetles across the gamut of the higher classification of Coleoptera.

Though the generic diversity is low in Chelonariidae, the family does present additional mysteries in addition to New Zealand’s *B. thoracica*. Adults of the other two genera may be common (especially in light traps) and colourful (particularly Neotropical *Chelonarium*). The larvae are poorly known, and have been considered aquatic (like many other members of Elateriformia), but are clearly terrestrial. Spangler (1980, 1991) reviews the literature and confirms the presence of larvae in the nests of termites and ants. The compact body form of adult *Chelonarium* and *Pseudochelonarium* may also confirm their presence in social insect nests (Beutel & Leschen 2004), but further study is required. Extrapolating the behaviour of the tropical Chelonariidae to *B. thoracica* is premature at this point, especially considering that the social insect fauna of New Zealand is so depauperate.....but keep on looking!

Acknowledgements

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Figure 2. The correct method for collecting *Brounia thoracica*.



Figure 3. The wrong method for collecting *Brounia thoracica*.

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