

# Ghost fungus *Omphalotus nidiformis* (Berk.) O.K.Mill (Marasmiaceae) as a host for the fungus Beetle *Thallis compta* Erichson, 1842 (Coleoptera: Erotylidae) In Northern Tasmania

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## Introduction

More than 1500 species of the predominately tropical beetle family Erotylidae (fungus beetles) are known globally, with about 120 known from Australia (Lawrence and Slipinski 2013). Australian Erotylidae are mycophagous as larvae (as well as adults in some species,) feeding within the fruiting bodies of both Agaricales and Aphyllophorales (mushrooms and bracket fungi; Hawkeswood, 1986; Hawkeswood *et al.* 1997; Lawrence & Britton 1991; Lawrence & Slipinski 2013). The biology and habits of the 17 named species of *Thallis* in Australia are poorly known. Hawkeswood (2003) recorded three adults of *T. erichsoni* were collected on the underside of the fruiting body of *Pseudotrampetes* (*Trampetes*) *gibbosa* (Polyporaceae) in south east Queensland but did not document feeding or

oviposition. Webb and Simpson (1991) recorded a single adult *T. australasiae* on *Polyporus myllittae*, large aggregations of adult *T. janthina* on *Piptoporus portentosus* as well as aggregations of *T. vinula* on *Polyporus squamosus*: all in New South Wales. In Tasmania, Bashford (2014) reared *T. femoralis* from the bracket fungi *Phellinus whalbergii* and *Ryvardenia cretacea* as well as *T. vinula* and *T. janthina*- also from *R. cretacea*.

*Thallis compta* is an aposematically coloured black and orange erotylid beetle ranging from 5-7 mm in length (Plate 1) and is widespread in south east Australia (Atlas of Living Australia; Moore 1990) as well as the drier eastern half of Tasmania (author, unpublished data; Bashford 2014) where it commonly flies to light traps in the summer months (authors obs.). The orange/red and black colouration of many members of the genus is



**Plate 1.** Adult *Thallis compta* on fruiting body of *Omphalotus nidiformis* at Riverside, Launceston, Tasmania. Photograph: Simon Fearn.

thought to provide crapsis on bracket fungi and large Agaricales fruiting bodies (Hawkeswood *et al.* 1997). The only previously documented potential host for *T. compta* was a single adult associated with hyphae of *Polyporus* sp. in NSW (Hawkeswood *et al.* 1997).

*Omphalotus nidiformis* (ghost fungus or jack-o-lantern mushroom) is most notable for its bioluminescent properties. It is known to occur primarily in southern Australia but was also reported from India in 2012. It is the only member of the genus known from Tasmania. The fan- or funnel-shaped fruit bodies are up

to 200-300 mm in diameter and usually found at the base of dead trees and stumps. Fruiting bodies are often found in overlapping clusters and are cream-coloured caps overlain with shades of orange, brown, purple, or bluish-black. The white or cream gills run down the length of the stipe, which is up to 80 mm long and 20 mm wide and tapers in thickness to the base (Grey & Grey 2005; Gates & Ratkowsky 2016). Typical specimens are featured in Plate 2.

This paper documents the first record of *Omphalotus nidiformis* as a larval host of *Thallis compta*.

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## Field Observations

On 4 November 2016 the author was conducting entomological field work in open woodland dominated by white gum (*Eucalyptus viminalis*) and black wattle (*Acacia mearnsii*) at Ecclestone Road, Riverside, Launceston, Tasmania (GDA 94: 0502334mE 5414255mN). On a portion of partially cleared land the author located five tree stumps (1 unidentified eucalypt and 4 *Acacia mearnsii*) ranging from 200-400 mm diameter within an area of approximately 20 m diameter. Large, recently emerged fruiting bodies of ghost fungus (*Omphalotus nidiformis*) were observed emerging from the base of the stumps (Plate 2). On closer inspection, large numbers of the fungus beetle *Thallis compta* were observed milling around on the fruiting bodies (Plate 1). It was a warm sunny mid-morning and the beetles were very active, with numerous pairs copulating and what appeared to be the larger males actively chasing each other away from portions of the fruiting bodies. It appeared that more than about 100 beetles were active across the five major clumps of fruiting body. Photographs were taken and 28 voucher specimens of *T. compta* collected and lodged in the entomology collection of the Queen Victoria Museum and Art Gallery (QVMAG; registration numbers QVM.2017.12.1116-1143).

## Housing of infested fruiting bodies

On 18 November 2016 the author returned to the site to collect the fruiting

bodies in an attempt to rear out adult *T. compta* thus confirming *O. nidiformis* as a larval host. The fruiting bodies were greatly reduced in size due to obvious desiccation. Four of the largest clumps were removed from the stumps with a hatchet as they were firmly adhered to the decomposing timber just below ground level. The fruiting bodies were placed in cardboard postal boxes approx. 240 x 180 x 80 mm and placed in a larger plastic crisper with air holes drilled in it and placed on a shelf in a shed. When the fruiting bodies were inspected on 3 December 2016 the postal boxes were filled with large quantities of frass and what appeared to be fine silk. Hundreds of pre-pupal larvae were present under the silk and frass. The author mistakenly anticipated that pupation would occur within the fruiting bodies with the adult beetles eventually emerging from them as reported by Bashford (2014) when rearing Erotylidae from fruiting bodies of bracket fungi. It now appears that the final instar larvae of *T. compta* in mushrooms decamp from the rapidly deteriorating fruiting bodies and most likely pupate in the surrounding soil. Although not ideal conditions, the author periodically kept the boxes humid with a small 'mister bottle' and the first adult beetles began to emerge in March 2017. Some of these were also lodged in the QVMAG collection (registration numbers QVM.2017.12.1426-1434). The author recommends that any future rearing of *Thallis* from Agaricales should follow the guidelines of Schigel (2008). Dry forest soil, sand or other substrates of fine fraction should be included in rearing boxes and kept moist with a



**Plate 2.** Clusters of overlapping fruiting bodies of *Omphalotus nidiformis* growing from the base of a eucalypt stump at Riverside, Launceston, Tasmania. Photograph: Simon Fearn.

‘mister bottle’. Extreme moisture must be avoided however to prevent mould growth and keeping some dry *Sphagnum* in the container will help to balance moisture levels.

## Concluding observations

Although the data in this work are limited, they may indicate two generations of *T. compta* per year, i.e. adults active in spring, with larval, pre-pupal and pupal stages completed in around 3 months, and a second generation of adults appearing in late summer/autumn. This may indicate a biannual strategy based around the peak fruiting period of host

fungi in the mildest and wettest parts of the year. Such a strategy would increase the likelihood that discrete patches of fruiting bodies could be colonised by adult beetles quickly while they were still in peak condition.

Little is known about Tasmanian mycophagous insects, and a great deal could be learned by collecting fruiting bodies and rearing out the associated insect species. It is important however to lodge voucher specimens with recognised institutions (museums and herbariums) of both fungal hosts and insects with as much associated information as possible.

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