

THE



SUNBIRD



Journal of the

**QUEENSLAND ORNITHOLOGICAL SOCIETY
(Birds Queensland)**

Volume 50

Pages 9-12

2023

THE SUNBIRD

Chief Editor

Richard Noske

Assistant Editor

Stephen Prowse

Production Editor

Annette Neill

The Sunbird is published by the Queensland Ornithological Society Incorporated (Birds Queensland). All issues of *Sunbird* and individual articles are available for download in PDF format to both members and non-members from the Birds Queensland website. They are also available online via the Informit e-Library (<https://search.informit.org>), by agreement with Birds Queensland.

The aims of Birds Queensland are to promote awareness and appreciation, as well as conservation and scientific study of birds, with particular emphasis on the birds of Queensland. The society holds a general meeting and several field excursions each month. All members receive a monthly newsletter. For enquiries, including membership, and back copies of *Sunbird* please contact us via email or visit our website.

The Secretary

PO Box 3784

South Brisbane BC Qld 4101

www.birdsqueensland.org.au

secretary@birdsqueensland.org.au

ISSN 1037-258X

Queensland Ornithological Society Inc.

Front Cover: Male Golden Bowerbird, Paluma © Jon Norling

Probable fungus on bower decorations of the Golden Bowerbird

Doug B. Herrington^{1,3}, Rob P. Reed¹ and Barry Muir²

¹*Birdwatching Tropical Australia, P.O. Box 746, Mossman, Queensland.*

²*PO Box 15003, Edge Hill, Queensland.* ³*Corresponding author email: herrington01@bigpond.com*

Abstract

The Golden Bowerbird *Prionodura newtoniana* is endemic to the montane rainforests of the Wet Tropics, where it occurs above 700m above sea level. Males build a maypole type bower, typically adorned with “Old Man’s Beard” lichen *Usnea sp.* At one bower we found an unusual, reddish-coloured substance attached to the lichen, which appears to be *Phaeotremella foliacea*, a known fungal parasite of *Usnea* lichen. We provide photographs of the fungus, and review ornithomycological associations with bowerbirds.

Observations

In September 2019 we located a Golden Bowerbird bower on Mt Lewis (16.60°S, 145.28°E; 1,039 m asl). On 7 August 2022, we noted that the north-western side of the bower had an almost spherical, bright reddish-coloured gelatinous-looking substance attached to “Old Man’s Beard” lichen *Usnea sp.*, the most common material used by this species to decorate its bowers (Frith & Frith 2004, 2008; Higgins *et al.* 2006). The material was ca. 5 cm in diameter. More of the material was present on the south-eastern side, where it was more widely spread, giving the impression it had been present for a longer period and had possibly disintegrated or been trampled upon.

By 13 August 2022 the bower had new reddish amorphous material on its south-western side (Plate 1). It measured ca. 4 x 2 cm and was incorporated into the root-like parts of the thallus of the lichen. The thallus was quite fresh compared to most of the other thallus material which was aged and can be seen in the background. On 2 October 2022, we noted three small spheres of similar reddish-coloured material, each measuring ca. 4 mm diameter (Plate 2). By 25 November, however, there was no presumed *Phaeotremella* fungus on the well-decorated bower, with a male in attendance, and by 7 March the bower lacked decorations.

A small fragment of the material was collected on 13 August, and mounted on a glass slide, stained with Congo Red and examined under a compound microscope. It was an amorphous, gelatinous substance containing hyphae with obvious clamp-connections indicating a fungal origin (Plate 3). No spores were located but there was a remnant of one basidium (the structure on which spores develop) which appeared to be septate – a cross-wall on a fungal thread. Based on gross morphology and microscopy, we believed the material to be the fruiting body of the fungus *Phaeotremella foliacea*, though a molecular analysis has not been undertaken.

P. foliacea is a known mycoparasite (a fungus that parasitises other fungi) (Spirin *et al.* 2018). Lichens are formed from a symbiotic relationship between a fungus and one or more algae species, and it is highly likely the *P. foliacea* was parasitising the fungal or algal component of the lichen (Plate 4).



Plate 1. Left, probable *Phaeotremella* fungus on lichen in the bower of a Golden Bowerbird; right, close-up, 13 August 2022 (Doug Herrington)



Plate 2. Probable *Phaeotremella* fungus growing on a Golden Bowerbird bower on 2 October 2022, showing variation in opaqueness (Doug Herrington)

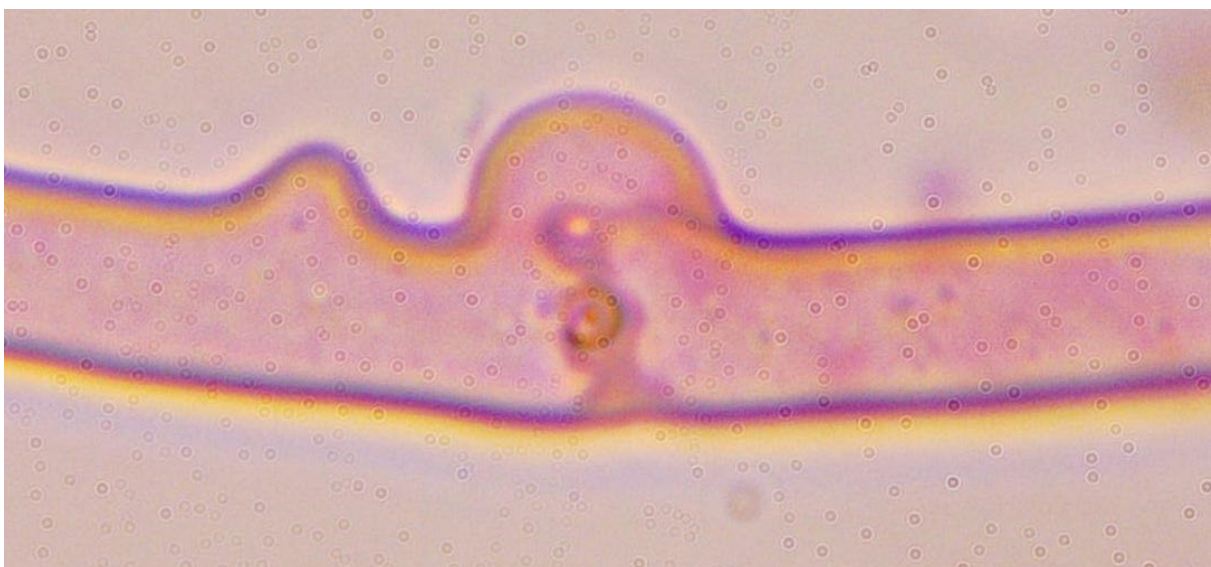


Plate 3. Evidence of a fungal origin – a “clamp-connection” in the *Phaeotremella* specimen at 1000x magnification. (Barry Muir)

Discussion

Apart from grey-green lichens (*Usnea sp.*), decorations in the bowers of Golden Bowerbirds may include the creamy-white flowers of jasmine, orchids and Silky Oaks, the creamy-white fruits of *Melicope sp.*, and small green fruits (Chisolm & Chaffer 1956; Warham 1962; Higgins *et al* 2006; Frith & Frith, 2004, 2008). These bowers can persist for up to 20 years, possibly due to “sticks becoming fused together by...the action of a fungus ubiquitous in the sub-canopy...” (Frith & Frith 2004). Frith & Frith (2004) also refer to a clear, sticky, jelly-like tree exudate in the bower of a Golden Bowerbird. It is possible that this exudate refers to the same material we observed, i.e., *Phaeotremella* fungus, given that the latter varied in opaqueness, as shown in the right-hand photograph of Plate 2 in which some parts are much clearer than the rest of the mass and compared to other photographs.

Bowers of the “maypole” bower-building bowerbird species of New Guinea can also persist for up to 20 years, but there has been no suggestion that fungal elements bind their twigs together (Frith & Frith 2004, 2008). The Streaked Bowerbird *Amblyornis subalaris* and Vogelkop Bowerbird *A. inornatus* decorate their bowers with various fungi but these do not appear to be associated with lichen. The bowers of Macgregor’s *A. macgregoriae*, Streaked, and Vogelkop Bowerbirds are also sometimes adorned with a “tree resin”. In the latter species it has been described as “...amber-like resin of pandanus trees...” (Frith & Frith 2008). It is possible that this resin is referable to the clear, jelly-like tree exudate on bowers of Golden Bowerbirds as described by Frith & Frith (2004), as well as the material we have observed, albeit the latter being mostly reddish in colour.

Male Golden Bowerbirds may store small, red wild pepper fruits (*Piper novae-hollandiae*) near their bower for later consumption (Frith & Frith 2004, 2008), but there are no records of these or any other amber or red objects on bowers as decorations. We found the *P. foliacea* fungus on only two more visits over 47 days of intermittent observation of the studied bower, but failed to find it on five other bowers on Mt. Lewis and elsewhere during the same period.

This is the first record of the reddish-coloured fungus (probably *P. foliacea*) on a Golden Bowerbird bower to our knowledge. The most likely explanation for its presence is that the male was visiting sources of *Usnea* that were host to *P. foliacea*, and inadvertently carried the fungus or its spores to the bower. We urge others to check for the presence of the fungus on bowers.

Acknowledgments

We are very grateful to the reviewer Clifford Frith for his invaluable comments and to Richard Noske for his improvements to the text. Finally, we thank Lloyd Nielsen for providing direction in the initial stages of the field observations.

References

- Chisholm, A. H. & Chaffer, N. 1956. Observations on the Golden Bowerbird. *Emu* 56: 1-39.
- Frith, C.B. & Frith, D.W. 2004. *The Bowerbirds Ptilonorhynchidae*. Oxford University Press, Oxford.
- Frith, C.B. & Frith, D.W. 2008. *Bowerbirds: Nature, Art and History*. Frith & Frith, Malanda.
- Higgins, P.J. Peter, J.M. & Cowling, S.J. (Eds.) 2006. *Handbook of Australian, New Zealand and Antarctic Birds. Vol. 7 Boatbill to Starlings*. Oxford University Press, Melbourne.
- Spirin, V.; Malysheva, V., Yurkov, A., Miettinen, O. and Larsson K. 2018. Studies in the *Phaeotremella foliacea* group (*Tremellomycetes, Basidiomycota*) *Progress in Mycology* 17(4):451-466
- Warham, J. 1962. Field notes on Australian bowerbirds and catbirds. *Emu* 62: 1-30.



Plate 4 Male Golden Bowerbird at a bower (Doug Herrington)

