**Trichia scabra** Rostaf. SM86 (2 specimen boxes) – collection also includes *Polycephalomyces tomentosus, Dactylaria parvispora* and *Hemitrichia serpula*

**Substrate:** old, dry, downed unidentified dead wood and bark in a *Nothofagus* woodland

**Collection site:** Rimutaka Forest Park, Five Mile Loop Track just beyond the turnoff to Grace’s Stream Campsite

**Collection date:** 22 November 2017

**Collector & Identifier:** Dan Mahoney

**Voucher materials:** dried herbarium material (SM86 - 2 specimen boxes) accompanied by three SMF (Shear’s mounting fluid) semi-permanent slide mounts of *Trichia scabra* and *Dactylaria parvispora* and two SMF slide mounts of *Hemitrichia serpula*; professional Portra colored-film, in-situ photos from a Zeiss dissecting scope (best scanned) and digital photos of microscopic detail from an Olympus BX51 microscope & Olympus DP25 digital camera; Dan’s comments.

**General collection comments:** The collection consists primarily of numerous clustered, single to occasional seemingly-fused, sessile sporangia of *T. scabra* – sporangia mostly with upper portions of their peridia eroded away, exposing the inner mass of capillitial elaters and spores. Common on the sporangia in some areas of the collection is the parasite *Polycephalomyces tomentosus* and in all areas (wood, bark, sporangia, etc.) the very abundant, dematiaceous saprophyte *Dactylaria parvispora*. *Hemitrichia serpula* lies just adjacent to the *T. scabra* sporangia in the collection and was, initially, thought to represent a less-well-represented (and unreported) plasmodiocarpous element of *T. scabra*. Some of these plasmodiocarps are donut-shaped while others are long and occasionally branched but never in the reticulate pattern characteristic of *H. serpula*. Closer macro and microscopic examination revealed the moderate to strongly spinose, congested (elater-free) capillitium and reticulate spores characteristic of *H. serpula*.

**Comments concerning each species in the collection:**

**Trichia scabra:** Here I have followed Stephenson (Stephenson, S.L. 2003. The Fungi of New Zealand Volume 3: Myxomycetes of New Zealand. Fungal Diversity Research Series 11: 1-238.). The collection fits his description reasonably well, hampered somewhat by the age and dryness of the collection which led to most spores collapsing in slide mounts. However, the thin, smooth, shiny-yellow, membranaceous, single-layered peridia and capillitia composed of simple elaters with closely-wound, spinulose spiral bands and short, acuminate apices fit this species. The capillitial elaters were somewhat
darker yellow to yellow-orange in mass as compared with the more yellowish spores. Spore ornamentation was less clear with many spores collapsed although more typical globose spores with faint reticulate markings were seen and photographed. Many other globose and collapsed spores seemed more verruculose/spinulose although I suspect that an SEM of these would show the fine-meshed reticulum instead. Globose spores I measured ranged from \((9–10)–12(–13)\) µm in diameter. Worth noting were the empty ‘sporangial skeletons’. These seemed to suggest a calyculus-like origin and a few such photos were also seen among the Google images. I believe, however, that these were the product of gradual erosion of the sporangial peridia, beginning at the top and finally resulting in a basal calyculus-like peridial remnant when the capillitial/spore mass was gone – this rather than any genetic predisposition as occurs in circumscissile dehiscence.

*Polycephalomyces tomentosus*: We have collected this white, simple, capitate synnematous parasite of Trichiaceae species on two earlier occasions: on *Trichia botrytis* SM68 = PDD 110441 and *Hemitrichia serpula* SM72 = PDD 110445. For numerous photos and comments on *P. tomentosus*, see the pdf on SM68. In the present *Trichia scabra* SM86 collection, it was present on many of the sporangia. There, even after extensive drying and fumigation, the viscid spore-containing area surrounding the synnemata capitate heads was still in a liquid state.

*Dactylaria parvispora*: This dematiaceous species was first observed on the yellow-orange sporangia of *Trichia scabra* and the donut-shaped plasmodiocarps of *Hemitrichia serpula*, but closer examination revealed it over much of the dark wood and bark of the whole collection. Its conidiophores were separate to tightly clustered in groups of up to 9, simple, smooth, tapering gradually from a swollen basal cell to the sporogenous sympodial apical region, mostly dark brown with numerous transverse septa but becoming subhyaline to hyaline in the sporogenous apical region. Lengths variable but many 300–400 µm and a few to 500 µm, 8–9(–12) µm wide just above the swollen basal cell and tapering to 4–5 µm wide near the sporogenous apex. Conidia single, obovoid or clavate (narrowly truncate basally), (2–)3(–4) septate, smooth, hyaline to subhyaline, borne holoblastically on short blunt denticles of the sympodially extending sporogenous zone; schizolytic and often clinging together along the sporogenous zone once detached, \((13–)14–16(–17.5) \times 4.5–5.5\) µm.

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Some thoughts on the identification of this specimen: At first my thoughts centered upon *Dactylaria triseptata* – see below in blue.

*Dactylaria triseptata* was first described by Matsushima (Matsushima, T. 1975. *Icones microfungorum a Matsushima lectorum*. Published by the author, Kobe.) as *Pleurophragmium triseptatum* but was transferred to *Dactylaria* (Castañeda R.F. & Kendrick, W. B. 1991. Ninety-nine conidial fungi from Cuba and three from Canada. *University of Waterloo, Biology Series 35, 1±132.*) as *Dactylaria triseptata*.


However, since then I have re-read Réblová’s 2009 article [Réblová, M. 2009. Teleomorph of *Rhodoveronaea* (Sordariomycetidae) discovered and re-evolution of *Pleurophragmium*. Fungal Diversity 36: 129-139.] and looked back over my information on *Dactylaria parvispora* (?) AEB 1180 (= PDD 102622). The AEB 1180 specimen is decidedly different than the present specimen (which is here recorded as part of the *Trichia scabra* SM86 collection), but both key close to *D. parvispora*. The former is more questionably so and, therefore, my ‘?’ while the latter more so and therefore lacking the ‘?’.

However, both are closer to *Dactylaria parvispora* than to *Dactylaria triseptata*. *D. triseptata* has distinctly cylindrical conidia while conidia of *D. parvispora* are obovoid, clavate or fusiform. Aside from this though, there is little morphological difference between *Dactylaria parvispora* and *Dactylaria triseptata* although de Hoog’s 1985 publication treats only *D. parvispora* with no mention of *D. triseptata* while Goh & Hyde’s 1997 treatment does just the opposite.

Presently the ‘*Dactylaria* complex’ is in flux and particularly the complex of specimens identified as (or near) *D. parvispora*.

Continued on the next page:
**Hemitrichia serpula**: Originally, I thought that the limited plasmodiocarpous sporulation of this species might be an aberrant state of *Trichia scabra*. Despite the close proximity to *T. scabra* on the wood/bark, however, microscopic examination soon proved otherwise. Prior to the present collection, we have collected this species 3 times: SM3 (= PDD 110383), SM54 (= PDD 110427) & SM72 (= PDD 110445). Collection SM72 included the parasite *Polycephalomyces tomentosus* on a small portion of the plasmodiocarp reticulum, but here (SM86) *P. tomentosus* was restricted to sporangia of *Trichia scabra*. The reader is referred to the descriptions and photos in the pdf’s of these earlier collections. The present collection lacked the reticulate plasmodiocarp and the reticulum of its spores was often less clear than those seen previously. All other features, however, were those of more typical *H. serpula* collections. Worth noting, perhaps, are some differences between the capillitium of the donut-shaped and the branching elongate components of the plasmodiocarp. The capillitial threads of donut-shaped portions were strongly twisted around each other while those of elongate portions were closely congested but not strongly twisted around each other. Also, the twisted capillitial threads had many longer spines (5–6 µm) while spines in elongated portions were mostly 3 µm or less. Spores and peridium details were the same in both.
In situ view of closely-clustered sessile sporangia from one portion of this large older collection. Most sporangia reveal only small areas of the still-intact, thin, smooth, shiny, membranaceous peridium with the inner yellow spore mass and yellow-orangish capillitium visible and often fusing with capillitial/spore masses from adjacent sporangia. The dotted-rectangle is explained on the next page.
In situ view of the more highly-magnified, dotted-rectangle from the preceding page. White arrows represent areas of the sporangia where the thin, smooth, shiny, membranaceous peridium is still intact. The orange arrow represents one of many white synnemata common on sporangial surfaces here and elsewhere in the collection. These are the parasite *Polycephalomyces tomentosus* often reported on this and other *Trichia* species. Ann’s and my collection of *T. botrytis* SM68 also exhibited this parasite. The *P. tomentosus* and saprophytic dematiaceous hyphomycete *Dactylaria parvispora* (also seen here) will be detailed later in this pdf.
In situ view of crowded empty sporangia (or those with limited orangish capillitial remnants). A calyculus-like peridium remnant seems to represent each sporangium BUT descriptions of this species don’t make any mention of a calyculus.
In situ view of another area of the collection with good views of the calyculus-like peridium remnants shown on the previous page.
Capillitial threads (elaters) with regular spiral ornamentation and short, acuminate apices. Spores often collapsed following 3 weeks of unseasonably dry weather plus 2 weeks delay before photography. These occasionally reticulate but more often appearing verruculose or spinose. 70% EtOH mount, X100 objective, brightfield microscopy.
A, B. Capillitial threads (elaters) with regular spiral ornamentation and short, acuminate apices. B. Note short spines along the spirals (arrowed).

Other photos. Spores, often collapsed; these occasionally reticulate (arrowed) but more often appearing verruculose or spinose. All photos 70% EtOH mount, X100 objective, brightfield microscopy.
In situ view of closely-clustered sessile sporangia. Note that orange arrows represent areas of the sporangia where the thin, smooth, shiny, membranaceous peridium is still intact. The now exposed capillitial/spore mass of each sporangium, however, is still very much intact. The ‘erosion’ of the membranaceous peridium appears remarkably uniform in all the sporangia, leading, perhaps, to the calyculus-like appearance seen in older empty sporangia. This gradual top-down ‘erosion’, rather than a predetermined circumscissile point of peridial detachment, may account for the lack of any descriptive reference to a calyculus for this species. As in an earlier photograph, Polycephalomyces tomentosus and Dactylaria parvispora are seen here also.
In situ view of *Polycephalomyces tomentosus* on a sporangium of *Trichia scabra*. Arrow ‘A’ points to the viscid spore mass atop the synnema. This spore mass was still a viscid liquid after drying for over a month. The white, capitate, sporogenous zone within the viscid mass is detailed on the next page. Arrow ‘B’ points to the rough synnema stalk. A photo on the next page reveals the globose verruculose cells responsible for that roughness.
A–C. Digital photo details of the *Polycephalomyces tomentosus* synnema: capitate sporogenous zone, simple stalk and spores, respectively. All are from water mounts, ×100 objectives & phase microscopy. A. Note the phialides atop the synnema. B. Arrow points to a verruculose cell on the synnema stalk. C. 3 × 2 hyaline ovoid spores.
In situ view of *Dactylaria parvispora* on sporangia of *Trichia scabra*. A. Arrow points to a cluster of roughly 9, simple, dematiaceous conidiophores. B. Arrow points to a region of the *T. scabra* sporangium where the thin, smooth, shiny, membranaceous peridium is still intact. C. Arrow points to a region of that sporangium where the membranaceous peridium is gone and the capillitial/spore mass is clearly seen.
In situ view of *Dactylaria parvispora* on a sporangium of *Trichia scabra*. Note where arrows point to a cluster of hyaline to faintly pigmented conidia in the sporogenous apical region of simple, dematiaceous conidiophores.
In situ view of *Dactylaria parvispora* on remnants of a donut-shaped plasmodiocarp of *Hemitrichia serpula*. Note the swollen bases on the dematiaceous, simple conidiophores (arrowed).
In situ views of *Hemitrichia serpula* plasmodiocarps. Note the reddish-brown or maroon peridium outer layer (white arrows) and the membranaceous shiny-yellow peridium inner layer (black arrows).
In situ views of *Hemitrichia serpula* donut-shaped plasmodiocarps & the conidiophores of *Dactylaria parvispora*. Photos shown here are the following: Upper left, capillitial/spore mass largely intact; upper right and lower, capillitial/spore mass reduced. Note the reddish-brown or maroon peridium outer layer (white arrows) and the membranaceous shiny-yellow peridium inner layer — remnants thereof in upper right and lower photos (black arrows).
Peridium views from a *Hemitrichia serpula* donut-shaped plasmodiocarp. Both the same field of view but with a different focus. Left: focus on the darker, thicker, debris-covered, outer layer. Right: focus on the lighter, thinner, membranaceous inner layer, with fine lace-like detail. Photos from Shears mounting fluid (SMF), ×100 objective, brightfield microscopy.
Reticulate spores from a *Hemitrichia serpula* donut-shaped plasmodiocarp. The majority of spores from both the *Trichia scabra* and *Hemitrichia serpula* in this collection had collapsed a bit after the recent unseasonably dry weather. Attempts to ‘rehydrate’ them to their normal globose condition were largely unsuccessful. Photo from Shears mounting fluid (SMF), ×100 objective, brightfield microscopy.
Twisted, spinose, capillitial threads from a *Hemitrichia serpula* donut-shaped plasmodiocarp. Left photo: water mount, ×40 objective, brightfield microscopy. Right photo: SMF mount, ×100 objective, brightfield — note the spiral ornamentation on the twisted capillitial threads and their prominent curving spines (those shown 5–6 µm long).
Congested capillitial threads from the elongate branched portion of the *Hemitrichia serpula* plasmodiocarp. Unlike donut-shaped portions, the threads aren’t strongly twisted around each other and the spines are shorter (approx. 3 µm). Water mount, ×40 objective, brightfield microscopy.