

Two new species of *Delitschia* from submerged wood

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Two new species of *Delitschia* are described from submerged wood; *D. palmietensis* collected in the Palmiet River in Durban Westville, South Africa and *D. fasciatispora* from the Black River, Mauritius. This brings the total of *Delitschia* species known from non-coprophilous habitats to four. *Delitschia palmietensis* and *D. fasciatispora* are described and illustrated with light micrographs and discussed in relation to other species in the genus. A key to the non-coprophilous *Delitschia* species is provided.

Key Words—aquatic; *Delitschia*; lignicolous.

In November 1994 we investigated the fungi developing on submerged decaying wood in a small portion of the Palmiet River in Durban Westville, South Africa. Amongst the numerous fungi collected we observed a bitunicate ascomycete which conformed to *Delitschia* Auersw. in all ways, except in its non-coprophilous habitat (Luck-Allen and Cain, 1975). A further species of *Delitschia* with a wide dark-brown band at the central septum was also found in the Black River in Mauritius in August 1995.

The history of *Delitschia* has been adequately discussed by Luck-Allen and Cain (1975) who reviewed the genus accepting 46 species. In their concept of *Delitschia*, asci were bitunicate and ascospores were dark, two-celled; each cell provided with an elongated germ slit and the whole spore surrounded by a hyaline gelatinous layer. They confined their concept to the coprophilous habit and excluded *Delitschia gymnospora* Munk on account of its non-coprophilous habitat and that in each cell of the ascospore the germ slit extended only along the middle third of the cell. Romero and Samuels (1991), however, described a further *Delitschia* species from decaying wood. The ascospores in this species had both a full length germ-slit and were surrounded by a gelatinous hyaline layer. The one difference was, therefore, the non-coprophilous habitat. In our species of *Delitschia* from the Palmiet River and Black River, ascospores also have a full length germ slit and are surrounded by a narrow mucilaginous sheath (=gelatinous hyaline layer). We also prefer to include our species in *Delit-*

schia, as like Romero and Samuels (1991) we do not feel that the habitat alone should exclude these fungi from *Delitschia*. We also consider that *D. gymnospora* should be maintained in *Delitschia* and provide a synoptic table and key to the four species of non-coprophilous *Delitschia* species.

It is necessary to compare *Delitschia palmietensis* K. D. Hyde & T. S. Steinke sp. nov. with similar species of *Delitschia*. It differs from the lignicolous *D. gymnospora* as in the ascospores of this species the germ slit is not full length and lacks a gelatinous hyaline layer (Luck-Allen and Cain, 1975). *Delitschia corticola* Romero & Samuels has much smaller ascospores (Romero and Samuels, 1991). Amongst the coprophilous species it is closest to *Delitschia didyma* Auersw. and *Delitschia variispora* Luck-Allen & Cain. The habitat on dung is probably significant at the species level, however, in *D. didyma* the ascospore dimensions differ (35–50 μm long vs 30–35 μm long) and the central septum is noticeably oblique (Cain, 1934; Luck-Allen and Cain, 1975). In *D. variispora* there are no hairs around the neck and the ascospores dimensions also differ (36–) 40–52 μm long vs 30–35 μm long). Several species of *Delitschia* from dung also have ascospores with a central dark-brown wide band (e.g., *Delitschia excentrica* Griff., *Delitschia illinoisensis* Luck-Allen, *Delitschia intonsa* Luck-Allen, *Delitschia perpusilla* Speg.) and should be compared with *D. fasciatispora* K. D. Hyde sp. nov. These species, however, differ as they have smaller or larger ascospores (Luck-Allen and Cain, 1975).

Key to lignicolous *Delitschia* species

1. Ascospores with wide dark-brown central band *D. fasciatispora*
1. Wide dark brown central banding lacking 2
2. Ascospores mostly longer than 30 μm , after forming part spores *D. palmietensis*
2. Ascospores mostly shorter than 30 μm , not forming part spores 3
3. Germ slit full length *D. corticola*
3. Germ slit extending to the middle third of each cell *D. gymnospora*

Table 1. Synopsis of lignicolous *Delitschia* species.

	<i>D. corticola</i>	<i>D. fasciatispora</i>	<i>D. gymnospora</i>	<i>D. palmietensis</i>
Ascomata	400–800 μm in diam, neck covered by dark-brown tomentum	300–600 μm in diam, neck smooth	500–800 μm in diam, no tomentum noted	310–430 μm in diam, neck covered by light brown tomentum
Asci	180–240 \times 12–15 μm	130–170 \times 10–12 μm	150 \times 18–22 μm	200–250 \times 10–12 μm
Ascospores	20–24 \times 9–11 μm , very dark brown, not forming part spores	20–24 \times 5–6 μm , wide central dark brown band	26–31 \times 9.5–12 μm , brown	30–35 \times 9–11 μm , black, some forming part spores
Germ slit	full length	full length	extending to middle third of each cell	full length

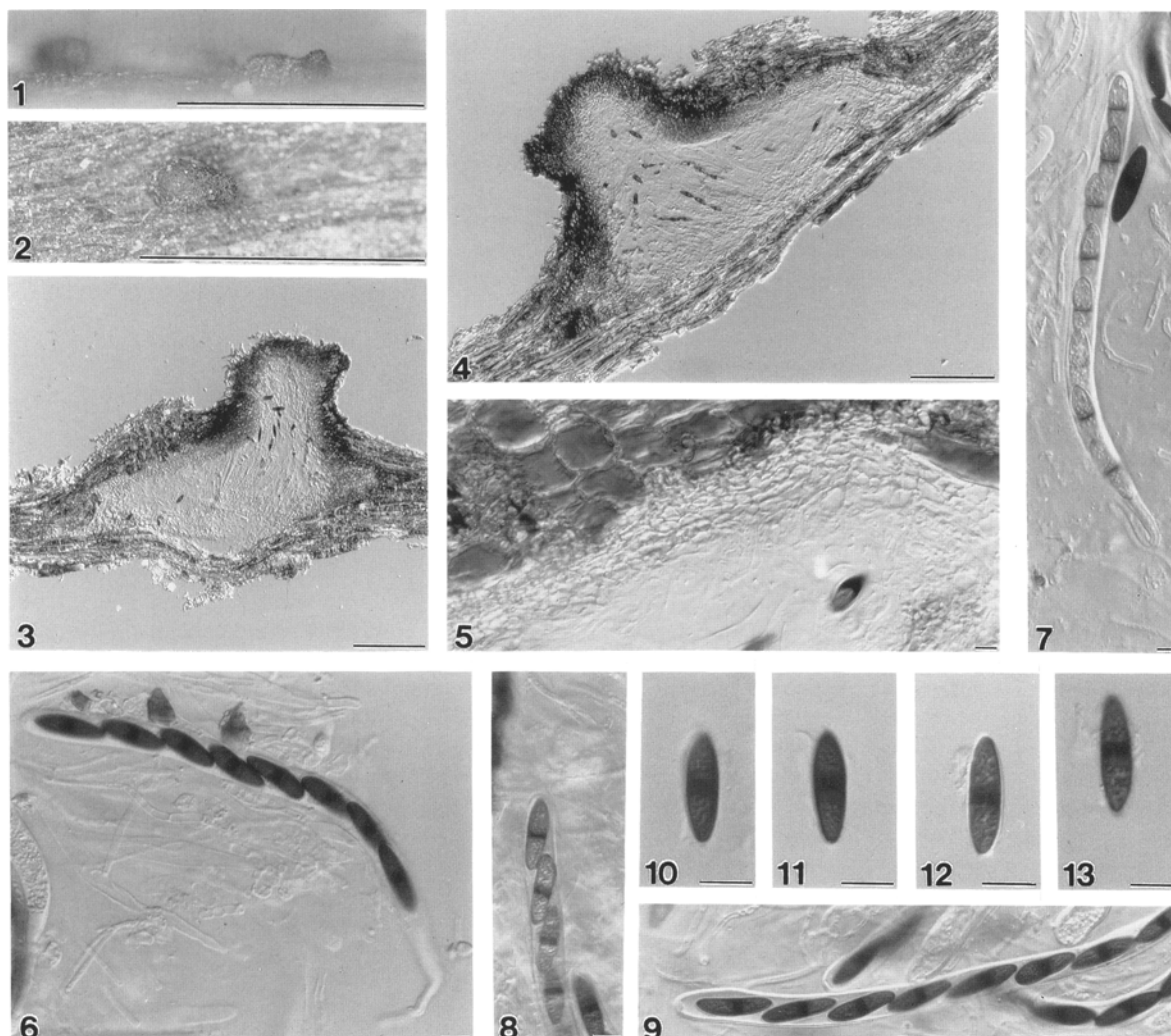
Taxonomy

Delitschia fasciatispora K. D. Hyde, sp. nov. Figs. 1–13

Ascomata 420–600 μm alta, 300–420 μm diam, ellipsoidea vel subglobosa, brunnea vel nigra, immersa, semi-immersa vel superficialia, coriacea, papillata. Asci

130–170 \times 10–12 μm , 8-spore, cylindrici, fissitunicati, pedicellati, apparato apicali praediti. Ascosporae 20–24 \times 5–6 μm , ellipsoideo-fusiformes, 1-septatae, brunneae, fasciatae (2.5–3.5 μm), hilo germinali longitudinaliter prolato et tunica gelatinosa praeditae.

Etym. from *fasciatispora*, Latin meaning “banded”



Figs. 1–13. *Delitschia fasciatispora*. 1, 2. Ascomata on host surface. 3, 4. Sections of ascomata. 5. Peridium. 6–9. Asci. 10–13. Ascospores with wide blackened band. Scale bars: 1, 2 = 1 mm, 3, 4 = 100 μm , 5–13 = 10 μm .

spores.”

Ascomata 420–600 μm high, 300–420 μm in diam, ellipsoidal or subglobose, dark brown to black, immersed, semi-immersed or superficial, coriaceous, papillate, long axis perpendicular, oblique or horizontal to that of the host surface (Figs. 1–4). Papilla central, superficial or partly embedded, smooth, periphysate (Figs. 3, 4). Peridium 34–60 μm wide, composed of several layers of light brown walled angular cells, darker at the outside (Fig. 5). Pseudoparaphyses 2.5–3.5 μm in diam, hypha-like, filamentous, septate, numerous, highly branched and anastomosing above the asci (Figs. 6, 7). Asci 130–170 \times 10–12 μm , 8-spored, cylindrical, fissitunicate, pedicellate, with a small ocular chamber (Figs. 6–9). Ascospores 20–24 \times 5–6 μm , overlapping uniseriate, ellipsoid-fusiform, 1-septate, brown, with a wide dark brown (2.5–3.5 μm) band at the central septum, a full length germ slit in each cell and surrounded by a thin spreading mucilaginous sheath (Figs. 10–13).

Habitat: Saprobic on submerged bark.

Known distribution: Mauritius.

Material examined: Mauritius: Tamarin, Black River,

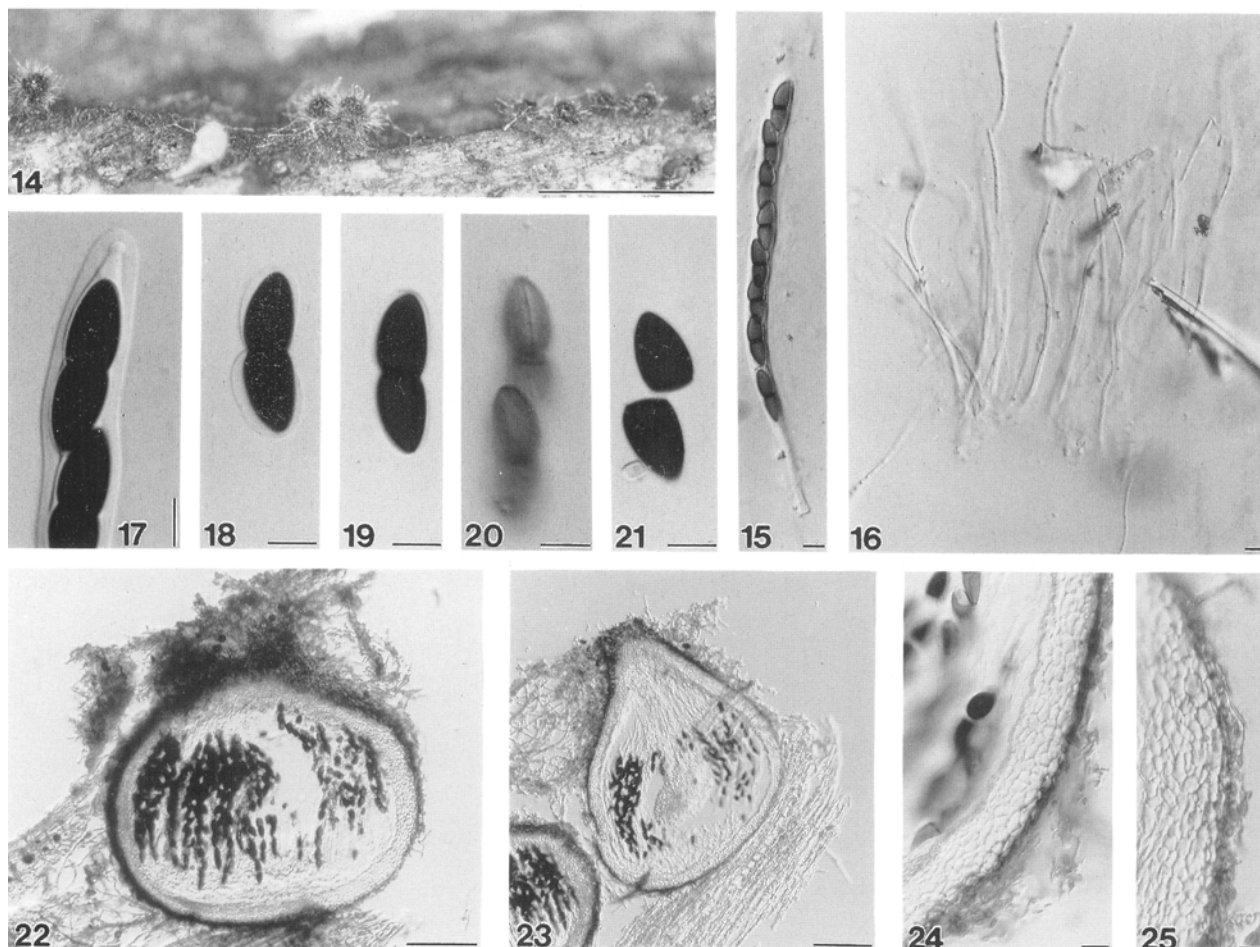
on submerged bark, 3 Aug. 1995, K. D. Hyde and A. Poonyth 2405 (BRIP 23151, holotype).

Delitschia palmietensis K. D. Hyde & T. S. Steinke, sp. nov. Figs. 14–25

Ascomata 310–420 μm alta, 310–430 μm diam, subglobose vel ovoidea, brunnea vel nigra, immersa vel semiimmersa, coriacea, papillata. Asci 200–250 \times 10–12 μm , 8-sporei, cylindrici, fissitunicati, pedicellati, apparato apicali praediti. Ascosporeae 30–35 \times 9–11 μm , fusiformes, brunneae, 1-septatae, hilo germinali longitudinaliter prolato et tunica gelatinosa praeditae.

Etym. from the Palmiet River.

Ascomata 310–420 μm high, 310–430 μm in diam, irregularly subglobose, subglobose or oval, brown to black, immersed or semi-immersed, coriaceous, papillate (Figs. 14, 22, 23). Papilla central, erumpent or partially embedded, covered in a light brown tomentum, periphysate (Figs. 14, 23). Peridium 20–30 μm wide, comprising several layers of hyaline angular cells, external layers of cells with brown walls (Figs. 24, 25). Pseudoparaphyses 2–3 μm in diam, hypha-like, filamentous, septate,



Figs. 14–25. *Delitschia palmietensis*. 14. Hairy papilla erumpent on wood. 15. Ascus. 16. Pseudoparaphyses in a gelatinous matrix. 17. Apical region of ascus with ocular chamber. 18–21. Ascospores. Note the full length germ slit (in 20), the mucilaginous sheath (in 18) and part spores (in 21). 22, 23. Section of ascomata. 24, 25. Peridia. Scale bars: 14 = 1 mm, 15–21, 24, 25 = 10 μm , 22, 23 = 100 μm .

numerous, highly branched and anastomosing above the asci (Fig. 16). Asci $200\text{--}250 \times 10\text{--}12 \mu\text{m}$, 8-spored, cylindrical, fissitunicate, pedicellate, with an ocular chamber and faint ring (Figs. 15, 17). Ascospores $30\text{--}35 \times 9\text{--}11 \mu\text{m}$, overlapping uniseriate, fusiform, dark brown, 1-septate, strongly constricted at the septum, forming part-spores in some, surrounded by a thin mucilaginous sheath (Figs. 18–21).

Habitat: Saprobic on submerged branch.

Known distribution: South Africa (Durban).

Material examined: South Africa: Durban, Durban-Westville, Palmiet River, on submerged wood, Nov. 1994, K. D. Hyde and T. Steinke, SAPR 51, KDH 2222 (BRIP 23150, holotype); on same lignicolous sample as *Aniptodera chesapeakensis* Shearer & Miller and *Anulatatus* sp. (SAPR 53).

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Literature cited

- Cain, R. F. 1934. Studies on coprophilus Sphaeriales in Ontario. University Toronto Stud. Biol. Ser. **38**: 1–126.
- Luck-Allen, E. R. and Cain, R. F. 1975. Additions to the genus *Delitschia*. Can. J. Bot. **53**: 1827–1887.
- Romero, A. I. and Samuels, G. J. 1991. Studies on xylophilous fungi from Argentina. VI. Ascomycotina on *Eucalyptus viminalis* (Myrtaceae). Sydowia **43**: 228–248.