

***Neolinocarpon penniseti* sp. nov.
on the grass *Pennisetum purpureum* (Poaceae)**

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Abstract – *Neolinocarpon penniseti* sp. nov. is described from the grass *Pennisetum purpureum* collected in Hong Kong. This is the only *Neolinocarpon* species found on a non-Arecaceae host. The species has shorter ascospores than the other species in the genus. A key to species of *Neolinocarpon* is provided.

ascomycetes / graminicolous fungi / *Neolinocarpon* / taxonomy

INTRODUCTION

We have been studying the fungi on various hosts in the tropics, which has resulted in descriptions of several new species and data on biodiversity (e.g., banana: Photita *et al.*, 2003a, b, 2004, 2005; Magnoliaceae: Phromputtha *et al.*, 2003, 2004a, b, c; 2005; palms: Pinnoi *et al.*, 2003a, b, 2004, 2006; Pinruan *et al.*, 2002, 2004a, b, c; *Pandanus*: Thongkantha *et al.*, 2003; Zingiberaceae: Bussaban *et al.*, 2001, 2003a, b, 2004). In this paper we describe a new species of *Neolinocarpon* from *Pennisetum purpureum* in Hong Kong.

Neolinocarpon K.D. Hyde was introduced by Hyde (1992b) to accommodate a species similar to *Linocarpon* Syd. & P. Syd., but with deeply immersed ascomata and a subapical globose structure in the ascus (Hyde *et al.*, 2000). Hyde *et al.* (1998) added five species and a new combination to *Neolinocarpon*. Hyde & Alias (1999) described *Neolinocarpon nypicola*, bringing the number of species to eight. All species of *Neolinocarpon* have so far been collected on palms. In this paper we describe a new species from grass and compare it to similar species in the genus.

MATERIALS AND METHODS

Dead stems of *Pennisetum purpureum* Schumach. (Poaceae) were collected from Lung Fushan Park, The University of Hong Kong, in October 2002 and May 2004. The stems were returned to the laboratory and incubated

individually in sealed plastic bags, with the addition of tissue paper moistened with sterilised water. Samples were examined for the presence of microfungi after one to five days of incubation. Squash mounts of sporulating fungi were made in water and examined with differential interference contrast microscopy. Cultures of the new species were obtained from single ascospores (Choi *et al.*, 1999) and deposited at The Hong Kong University Culture Collection, HKUCC.

TAXONOMY

Neolinocarpon penniseti W. Bhilabutra et K.D. Hyde, sp. nov. Figs 1-13

Ascomata 415-475 μm diam, 280-440 μm alta. *Asci* (78-) 80-105 \times (7.5-) 8.8-10 (-11.5) μm . *Ascospores* (52-) 57-64 (-84) \times 2.5-3 μm , *filiformia*, *hyalinae*, *unicellulares*, *ad apicem rotundatae*, *ad basim angustatae*.

Etymology: *penniseti*, in reference to the host, *Pennisetum purpureum*.

Ascomata deeply immersed in host tissue, developing beneath a dark, sunken, conspicuous clypeus, which is 245-390 μm diam. In the centre of each clypeus there is a shiny, black, 75-130 μm diam papilla (Fig. 1). *Ascomata* in section, 415-475 μm diam, 280-440 μm high, subglobose (Fig. 2). *Ostiole* 48-66 μm diam, periphysate (Fig. 3). *Peridium* (20-) 30-37.5 (-44) μm thick, comprising two strata; outer stratum fused at the outside with host tissue, consisting of thin brown-walled, angular cells; inner stratum composed of 4 layers of hyaline globose cells (Figs 4-5). *Paraphyses* (2.5-) 3-6.3 (-8.8) μm wide at the base, hypha-like, septate, unbranched, tapering slightly at the apex (Figs 6-7). *Asci* (78-) 80-105 \times (7.5-) 8.8-10 (-11.5) μm (\bar{x} = 94.5 \times 9.2 μm , n = 25), 8-spored, fusiform to cylindrical, mainly straight to curved, tapering to a narrow truncate apex, pedicellate, unitunicate, with a subapical, refractive, non-amyloid ring, 1.7-3.8 μm high \times 2-3.5 μm diam (\bar{x} = 2.5 \times 3.5 μm , n = 10) (Figs 8-9). *Ascospores* (52) 57-64 (-84) \times 2.5-3 μm (\bar{x} = 61 \times 2.8 μm , n = 50) fasciculate, filiform, mostly curved, hyaline, unicellular, apex rounded, attenuated towards the rounded base, with refringent septum-like bands (Figs 10-13). Colonies on potato-dextrose agar plate reaching 9 cm diam in 20 days at room temperature (25 °C), brownish-green, with white margin and woolly aerial mycelium, dark greenish-brown spots visible from below. No sporulating structures formed.

Distribution: HONG KONG.

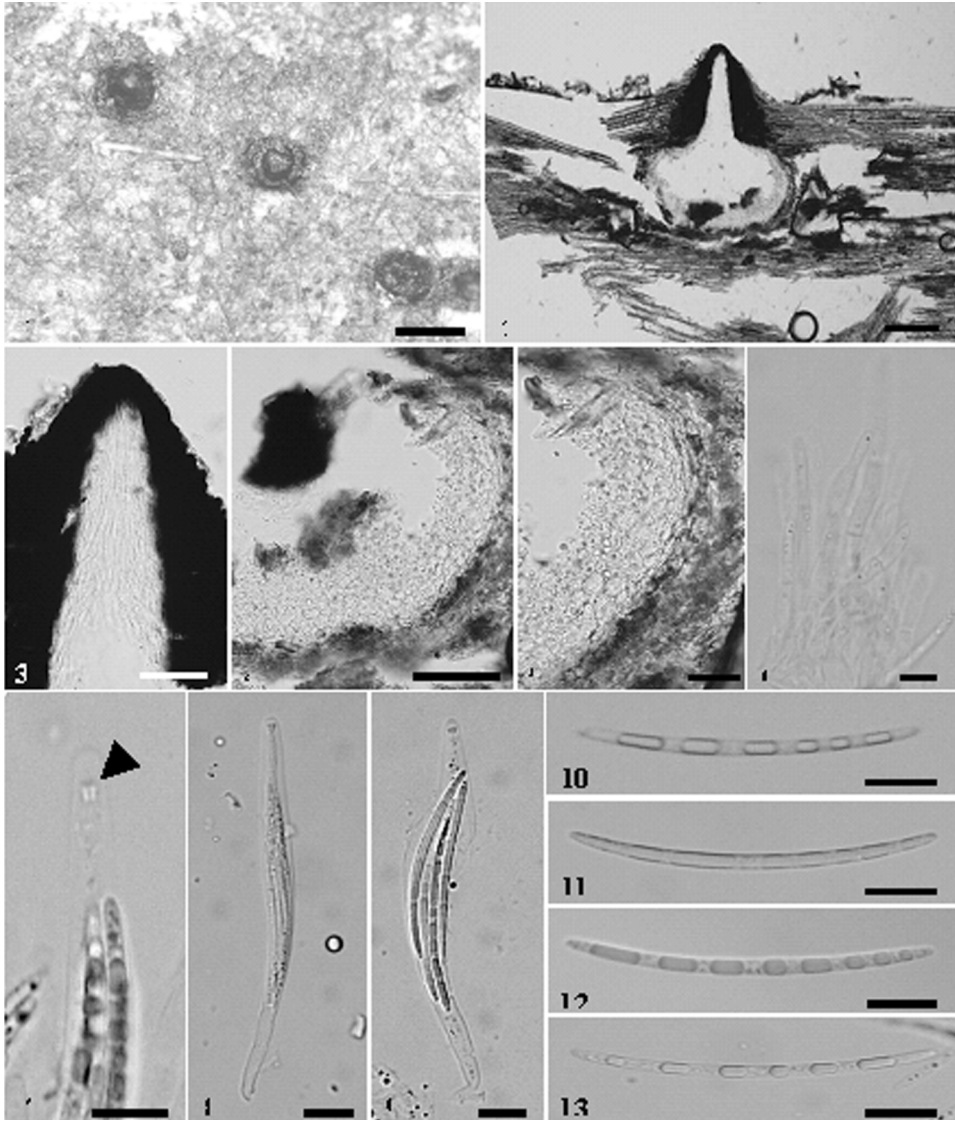
Anamorph: Unknown.

Habitat: *Pennisetum purpureum* Schumach. (Poaceae).

Holotype: China, Hong Kong SAR, Hong Kong Island, The University of Hong Kong, Lung Fushan Park, on dead stem of *Pennisetum purpureum*, 3 Oct. 2002, W. Bhilabutra & K. M. Wong, HKU(M)17153 (holotype); other collection 10 May 2004, W. Bhilabutra, HKU(M)17486, PDD 78747 (paratype); exatype cultures were deposited at Hong Kong University Culture Collection (HKUCC), HKUCC 10306 and HKUCC 10307.

DISCUSSION

Neolinocarpon penniseti is very similar to *Gaeumannomyces* Arx & D.A. Olivier (Magnaporthaceae) in having ascomata which are immersed in host tissue and produce, multiseptate, filamentous ascospores (von Arx & Olivier,



Figs 1-13. *Neolinocarpon penniseti* (from holotype). 1. Appearance of fruiting bodies on the host surface. Note that the papillae are conspicuous. 2. Vertical section through an ascoma. 3. Vertical section through papillae. 4-5. Section through peridium. 6. Paraphyses. 7. The subapical ring (arrowed head). 8. Ascus. 9. Ascus with refractive body. 10-13. Ascospores. Scale bars: 1 = 300 μ m, 2 = 100 μ m, 3 = 50 μ m, 4-5 = 20 μ m, 6-13 = 10 μ m.

1952). However, *N. penniseti* differs from species of *Gaeumannomyces* in producing deeply immersed ascomata in the host tissue, non-septate ascospores and in not producing superficial, lobed, brown, hyphopodiate mycelium. Furthermore, anamorphs of *Gaeumannomyces*, where known, are *Phialophora*-like (Walker, 1980), *Harpophora* W. Gams (Gams, 2000) or *Trichocladium* Harz (Kohlmeyer

et al., 1995), while those of *Neolinocarpon* are unknown. *Linocarpon* is similar to *Neolinocarpon*, but is restricted to superficial or slightly immersed ascomata, lacking a refractive globose body in the ascus tip (Hyde, 1992a; Hyde, *et al.*, 1998). Species of *Neolinocarpon* differ from those of *Linocarpon* in producing deeply immersed ascomata forming below flattened or a slightly raised clypeus, and often with a refractive globose body below the apical ring (Fig. 9) (Hyde, 1992b).

Like in *N. inconspicuum* K.D. Hyde, and *N. nonappendiculatum* K.D. Hyde, *N. pennisetia* lacks appendages at the apices of the ascospores. Its ascospores are shorter than those of either *N. inconspicuum* (76-89 μm) or *N. nonappendiculatum* (114-138 μm). The papillae of *N. penniseti* and *N. nonappendiculatum* are conspicuous, while those of *N. inconspicuum* are not readily observed. *Neolinocarpon* species are presently only known from Arecaceae (Hyde & Alias, 1999) and submerged wood (probably submerged palm) (Ho *et al.*, 2002). This is the first record of a *Neolinocarpon* species from a grass (Poaceae).

KEY TO THE SPECIES OF NEOLINOCARPON

1. Ascospores with appendage 2
Ascospores lacking appendages 7
2. Ascospores longer than 65 μm 3
Ascospores 42-64 \times 2-3.5 μm ; mucilaginous pad at ascospore base
..... *N. enshiense* K.D. Hyde *et al.* 1998
3. Intertidal on *Nypa* 4
Terrestrial on other palm hosts 5
4. Ascospores 70-119 \times 2-3 μm , with a mucilaginous appendage at one end; asci
136 \times 11-12 μm *N. globosicarpum* K.D. Hyde 1992
Ascospores 92-117 \times 2-3.8 μm , with an irregular mucilaginous appendage at
one end; asci 100-164 \times 8-10 μm *N. nypicola* K.D. Hyde & Alias 1999
5. Basal appendage keel-like; ascospores 81-107(-126) \times 2.5-3.5 μm
..... *N. australiense* K.D. Hyde *et al.* 1998
Appendage a crescent-shaped or mucilaginous pad 6
6. Ascospores 68-85 \times 2.5-3.5 μm , with a basal crescent-shaped mucilaginous
appendage *N. calami* K.D. Hyde *et al.* 1998
Ascospores 73-95(-106) \times 1.5-2.2(-2.5) μm , with a mucilaginous pad at base.
..... *N. eutypoides* (Penz. & Sacc.) K.D. Hyde *et al.* 1998
7. Ascospores longer than 65 μm 8
Ascospores (52.5-)-57-64(-84) \times 2.5-3 μm *N. penniseti*
8. Ascospores 76-98 \times 2-3 μm ; ascomata inconspicuous
..... *N. inconspicuum* K.D. Hyde *et al.* 1998
Ascospores 114-138 \times 2-3 μm ; ascomata conspicuous.
..... *N. nonappendiculatum* K.D. Hyde *et al.* 1998

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