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Short communication

Naemacyclus culmigenus, a newly reported potential pathogen to *Miscanthus sinensis*, new to Japan

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ABSTRACT

Since the summer of 2010, a discomycete with erumpent apothecia associated with a leaf blight of *Miscanthus* leaves, were often collected. The morphological characteristics of the fungus suggested it was a member of the Helotiales rather than the Rhytismatales and this was supported by a phylogenetic analysis. Based on a morphological comparison with the type specimen of *Naemacyclus culmigenus*, currently known from Poaceae (*Andropogon* and *Panicum*), it was identified as *N. culmigenus*, new to Japan. The molecular phylogenetic analysis showed that the generic delimitation of *Naemacyclus* and related species requires clarification, as does their higher classification within the Leotiomycetes.

Since the summer of 2010, leaf blight of *Miscanthus* leaves in *Miscanthus* grass field has been recognized in Sugadaira Montane Research Center, University of Tsukuba in Sugadaira, Nagano Prefecture, central Japan. The symptom starts from a development of reddish zonation in the middle area of the leaf along the vein at the apical region, followed by the expansion of the reddish zone to the marginal and to the basal areas, and ends up in total death of the leaves. The infected individual became dwarf compared to the healthy plants. When the dead leaves were incubated in a moist chamber, erumpent apothecia appeared. The diseased plants were found to form a wide patch as large as c. 35 m in diameter (Suzuki, in preparation). The apothecia were also collected from nature in the autumn, at the same sites where the disease was present earlier in the season.

The fungus has some characteristics of the Rhytismatales, erumpent apothecia and asci with an undifferentiated apex. However, it did not produce a melanized stroma and ascospores were not equipped with a gelatinous sheath, characters which suggest the Helotiales. Based on the key to the helotialean genera provided by Korf (1973), *Naemacyclus* Fuckel was suggested to be a possible genus. The present fungus was

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morphologically most close to *N. culmigenus* Ellis & Langloìs (Ellis and Everhart 1893) among the presently known 21 taxa of *Naemacyclus* (Index Fungorum, http://www.indexfungorum.org/Names/Names.asp as of Feb. 10, 2013). Although *N. culmigenus* had never been known to occur on *Miscanthus*, it has been known from *Andropogon* and *Panicum*, both belonging to Poaceae. Based on the comparison with the holotype (BPI 1668994), we confirmed the morphological identity. Because the present fungus has never been described in detail to our knowledge (Ellis and Everhart 1893; Saccardo 1895), it is described here with photographs and illustrations. Color codes followed the Pantone color code adopting CYMK system referring to a Pantone color bridge (Anonymous 2005).

Naemacyclus culmigenus Ellis & Langloìs, Proc. Acad. nat. Sci. Philad. 46: 151. 1894. Figs. 1–3.

Apothecia arising from a mass of pseudoparenchymatous cells, hyaline to pale dark colored, erumpent through the epidermis of the host, narrow elliptical to elongate, 0.3–0.4 0.15–0.2 mm, ruptured piece of the epidermis often attached around its openings. Disc smooth when fresh, livid-white with some shade of pale blue (Pantone 656PC=C10M2YK), drying scurfy, pale gray to white (Pantone

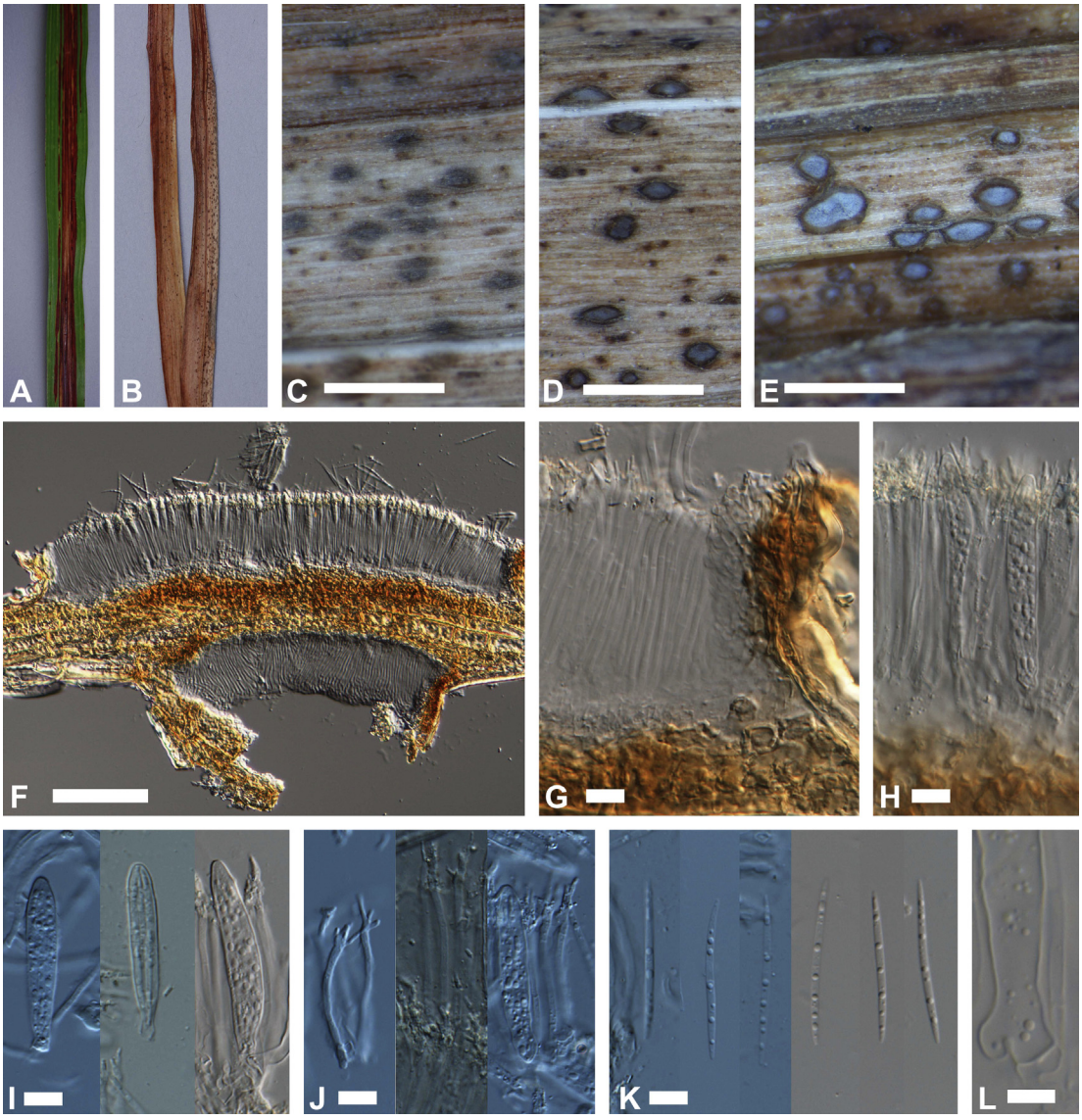

Fig. 1 – *Naemacyclus culmigenus* (TNS-F-41728). A, B: Symptoms occurring on the host. A: Mid-stage symptom showing reddish elongate zonation along the leaf vein at the middle with green marginal areas. B: Late stage showing the occurrence of apothecial spots. C–E: Close up of apothecia on the host. C: Apothecia occurring underneath the epidermis. Several apothecia showing a slit-like openings. D: Erumpent and opened apothecia showing the hymenium. E: Mature apothecia. F: Vertical section through the host showing two apothecia on both sides of the leaf. The apothecium at the lower side immature. G: Close up of the marginal area showing the textura angularis ectal excipulum. H: Close up of the part of the hymenium showing the Ascus and epithecial layer with marked crystals. I: Ascus. J: Paraphyses. Note branched and pointed apecis. K: Ascospores. L: Close up of the ascal base showing the crosiers. Scales: C–E, 0.5 mm; F, 100 μm; G–K, 10 μm; L, 5 μm.