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A new *Massarina* and a new *Wettsteinina* (Ascomycota) from freshwater and tidal reeds

by

Gunther Van Ryckegem

Ghent University, Department of Biology, Plant Sciences
K.L. Ledeganckstraat 35, B-9000 Ghent, Belgium
e-mail: Gunther.VanRyckegem@rug.ac.be

and

André Aptroot

Centraalbureau voor Schimmelcultures, P.O. Box 85167
NL-3508 AD Utrecht, The Netherlands
e-mail: aptroot@cbs.knaw.nl

With 16 figures

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Abstract: Two new ascomycete species growing on reed (*Phragmites australis*) culms are described and illustrated: *Massarina fluviatilis* sp. nov., from Belgium, on tidal reed, and *Wettsteinina moniliformis* sp. nov., from Denmark, on freshwater reed.

Key words: *Phragmites*, ascomycetes, Belgium, Denmark, Dothideales.

Introduction

To understand fungal ecology and community structure, a firm knowledge of the systematics of the studied organisms is a prerogative. Existing useful and complete keys to access the taxonomical knowledge of the two genera discussed here are found in Aptroot (1998) for *Massarina* and in Shoemaker & Babcock (1987) for *Wettsteinina*. Fungi have received some attention in freshwater and tidal systems (Apinis et al. 1972 a & b, Taligoola et al. 1972, Poon & Hyde 1998 a & b) as crucial decomposers of an important emergent macrophyte (*Phragmites australis* (Cav.) Steud.). From reed, several species of *Massarina* have been reported: *Massarina*

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aquatica J. Webster, *M. arundinacea* (Sowerby : Fr.) Leuchtmann, *M. phragmiticola* Poon & K.D. Hyde, and *M. thalassiae* Kohlm. & Volkmann-Kohlm. The genus *Wettsteinina* s. str. is not yet known to occur on reed. *Wettsteinina niesslii* E. Müller, originally described from reed, was lectotypified and classified in the Lophiostomataceae by Scheuer (1995), and also by Shoemaker & Babcock (1987). It is not congeneric with the type of *Wettsteinina*. Only one record of a *Wettsteinina* species in a freshwater habitat is cited in the literature, as '*Wettsteinina* sp.' on *Equisetum fluviatile* (Magnes & Hafellner 1991, Shearer 1993). This species had longer ascospores than the new species described below. Knowledge about the ecology of the genus is still scanty, but many *Massarina* species are known from freshwater habitats (Hyde & Aptroot 1998) and marine and/or tidal systems (Kohlmeyer & Volkmann-Kohlmeyer 1991, Hyde & Pointing 2000, Kohlmeyer et al. 1995, Poonyth et al. 1999). Here we describe a new *Massarina* species from a freshwater tidal system in Belgium and a new *Wettsteinina* species from a freshwater lake shore in Denmark.

Massarina fluviatilis Aptroot & Van Ryckegem, sp. nov. Figs 1-7

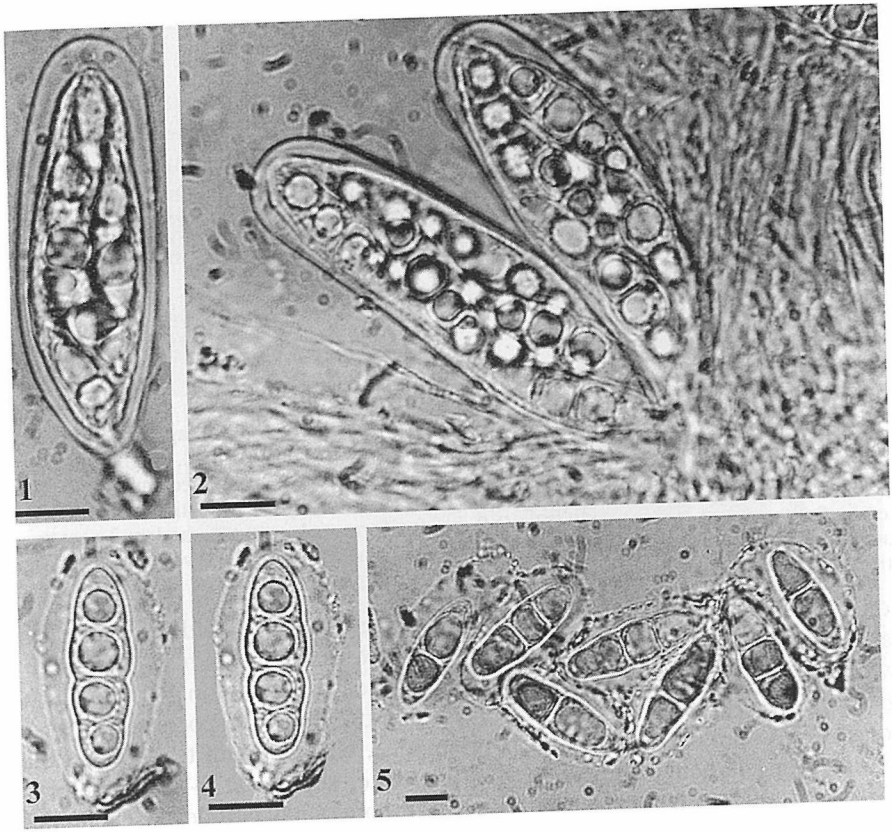
Ascomata 180-210 µm diam., 180-200 µm alta, subglobosa vel globosa, immersa, nigra, gregaria ostiolata, clypeo nigro praedita. Pseudoparaphyses numerosae, 3-4 µm latae, multiseptatae, non ramosae, non anastomosantes. Asci bitunicati, 69-82 × 18-23 µm, oblongi ad cylindrici, late rotundati ad apicem, stipite brevi. Ascosporae 24-31 × 7-10 µm, fusiformes, plerumque 2-septatae, tandem 3-septatae, septo primo submedio, ad septa constrictae, hyalinae, guttulatae; involucro gelatinoso circumdatae in aqua ad 5 µm dilatato, non constricto in medio.

Ascomata 180-210 µm diam., 180-200 µm high, subglobose to globose, immersed, black, clustered in small groups or short rows, each with a protruding, central, black, inconspicuous, small papillate ostiole; clypeus black, of dark brown, 1-1.5 µm wide hyphae. Peridium 20-25 µm thick, composed of carbonaceous, thick-walled, polygonal cells, surrounded by hyaline hyphae. Pseudoparaphyses numerous, 3-4 µm wide, septate at 7-8 µm intervals, not branched or anastomosing. Asci bitunicate, 69-82 × 18-23 µm, oblong to cylindrical, broadly rounded at the apex, tapering to a short stipe, with irregularly bi- or triseriate ascospores. Ascospores 24-31 × 7-10 µm, broadly fusiform with rounded ends, usually 2-septate, becoming 3-septate; first septum submedian, the second cell from above slightly swollen; ascospores constricted at the septa, mainly the median septum, mostly hyaline, browning with age, with many, small guttules, surrounded by a wide expanding mucilaginous sheath, which is up to 5 µm thick and not constricted around the septa.

Host: *Phragmites australis*.

Ecology: found in slightly brackish tidal marsh, on dead leaf sheaths still attached to standing, one-year-old reed stems, at a height of approximately 1.5 m above the soil surface.

Figs 1-7. *Massarina fluviatilis*, holotype. 1. Ascus. 2. Asci and hamathecium. 3-6. Ascospores with mucilaginous sheath. 7. Asci. All illustrations made in water mounts. Scale bars = 10 µm.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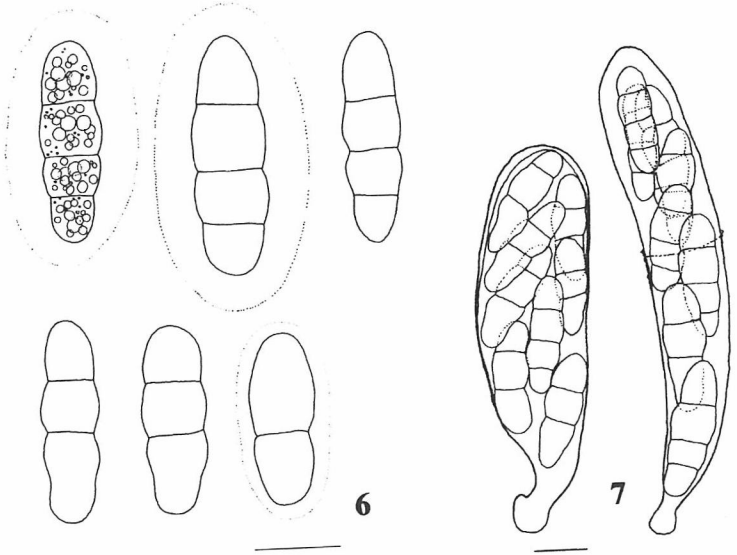
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Collection examined: Belgium, East-Flanders, Tielrode tidal marsh near river Schelde, IFBL coordinates: C4 52 41, 10/04/00, Van Ryckegem 509 (Holotype, GENT; isotype, CBS).

The new species seems quite close to the type of the genus, *M. eburnea* (Tul. & C. Tul.) Sacc. (Aptroot 1998), from which it differs mainly by smaller ascospores and subglobose to globose (not flattened), immersed, gregarious ascomata. In a cladistic analysis based on 18S nuclear rRNA (Liew et al. 2000), some members of the genus *Massarina* in its current circumscription did not cluster in the same clade, suggesting a possible generic segregation, but *M. fluviatilis* is certainly congeneric with the type of *Massarina*.

Wettsteinina moniliformis Van Ryckegem & Aptroot, sp. nov. Figs 8-15

Ascomata 100-150 µm diam., 90-120 µm alta, globosa vel ovoidea, nigra, aggregata in usque 7 seriebus, in stromata immersa; ostiolum 35-40 µm altum, usque ad 60 µm diam., papillatum, nigrum. Stromata usque ad 350 µm alta, 2 cm longa, lenticularia, atra. Filamenta hamathecii numerosa, 4-6 µm lata, multiseptata, moniliformia, ramosa, guttulata. Asci bitunicati, fissitunicati, 61-66 × 13-16 µm, numerosi, fusiformes. Ascosporae 19-23 × 7-9 µm, fusiformes, 1-septatae, tandem 3-septatae, ad septum primum constrictae, hyalinae (postea fuscae), guttulatae, glabrae (postea verrucosae); involucro gelatinoso indistincto circumdatae.

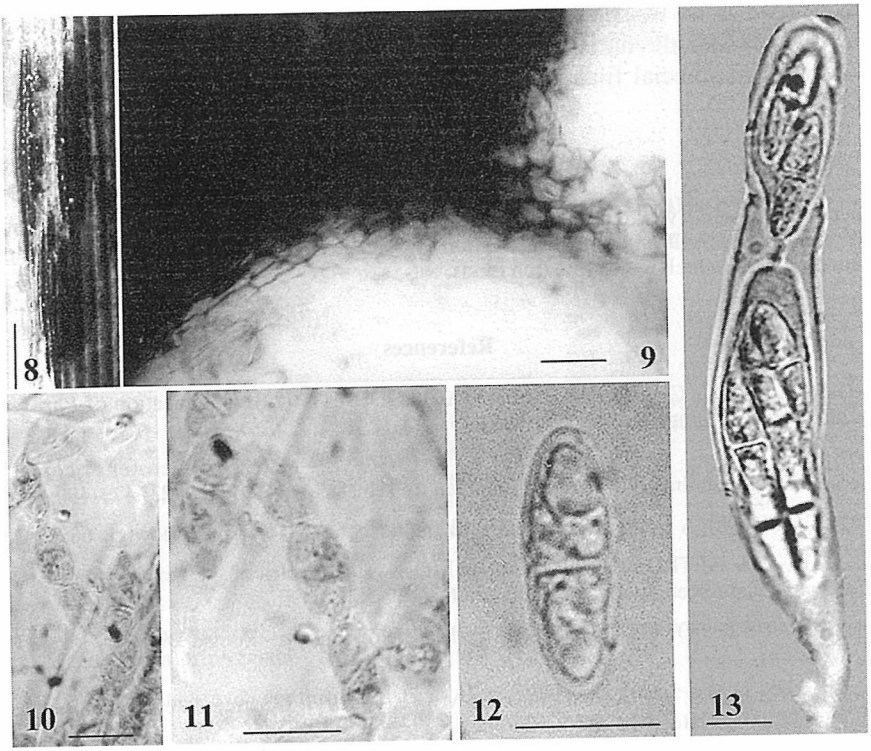
Ascomata 100-150 µm diam., 90-120 µm high, globose to ovoid, aggregated into linear rows, black, immersed in basal stroma; ostioles 35-40 µm high, and up to 60 ìm wide, papillate, black. Stroma up to 350 µm thick and 2 cm long, lenticular, with longitudinal orientation on stems, black, with up to 7 rows of ascocarps aggregated. Peridium 20-25 µm, textura angularis-prismatica, with cells up to 5-10 µm diam. Hamathecium filaments numerous, 4-6 µm wide, septate at 6-10 µm intervals, moniliform, branching but not anastomosing, with some small guttules. Asci bitunicate, endotunicat remaining intact after initial rupturing of the exotunica , 61-66 × 13-16 µm, short-stipitate, numerous, broadly fusiform with 8 bi- to triseriate overlapping ascospores. Ascospores 19-23 × 7-9 µm, broadly fusiform with rounded ends, 1-septate, becoming 3-septate, constricted at the first septum, apical cell little enlarged, hyaline (later becoming brown), with many small guttules, smooth, when old verrucose; sheath uniform, indistinct, slightly constricted at the septum, narrow.

Host: *Phragmites australis*.

Ecology: on leaf sheaths of reed lying on the bank of a freshwater lake.

Collection examined: Denmark, East-Jylland, Hald Ege at Niels Bugges Kro South of Viborg, UTM-coordinates: NH2149 or 0521 6249, 02/06/00, Van Ryckegem 561 (Holotype, GENT; isotype CBS).

Figs 8-15. *Wettsteinina moniliformis*, holotype. 8. Surface view of several stromata with individual ascomata. 9. Section through ascomata showing the structure of the ascomal wall. 10-11. Parts of hamathecium filaments. 12. Ascospore. 13. Ascus with protruding endotunica through partly ruptured exotunica. 14. Ascospores. 15. Ascus with hamathecium filament. 16. Hamathecium filaments. All illustrations made in water mounts. Scale bars in 8 = 5 mm; in 9-16 = 10 µm.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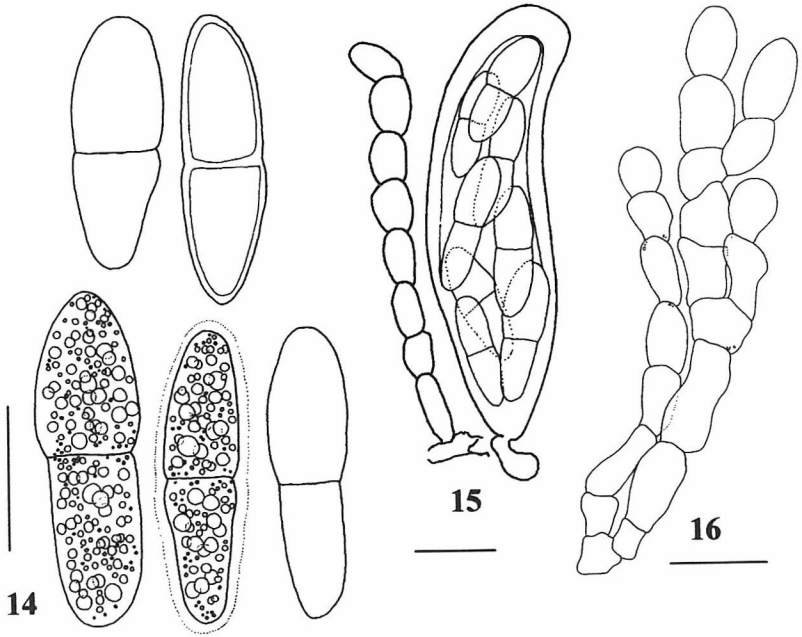
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The new species of *Wettsteinina* has among the smallest spores in the genus, but nevertheless shows all charcteristics of the genus, including the characteristic wide, moniliform hamathecial filaments.

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