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**Fungal diversity and community structure on  
*Phragmites australis* (Poaceae) along a salinity  
gradient in the Scheldt estuary (Belgium)**

by

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With 4 figures and 7 tables

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**Abstract:** We examined fungal communities on stems and leaf sheaths of common reed (*Phragmites australis*) in four tidal marshes along a salinity gradient (mesohaline to freshwater) in the Scheldt estuary (Belgium) by direct observation. One hundred and fourteen taxa, the highest number of taxa ever recorded during a survey of phragmiticolous fungi, were found, with 56 taxa (49%) in the ascomycetes, 6 taxa (5%) in the basidiomycetes and 52 taxa (46%) of anamorphic fungi, the latter comprising 30 (26%) coelomycetes and 22 (19%) hyphomycetes. Fungal diversity in tidal marshes compared is lower than that in non-tidal reed marshes. Species distribution on reed litter, investigated by multivariate analysis, was strongly correlated with flooding frequency and salinity. Influences of salinity on the fungal community are discussed and tested by a culture experiment. Taxa were divided into three basic distributional types: taxa present only in the saline-brackish water zone, species present only in the freshwater zone, and a group of eurytopic species found over the entire salinity gradient sampled. Indicator species for each group were determined. In two sites, mesohaline brackish and freshwater, the vertical distribution of mycota was analysed. Higher similarities between the same vertical zones, especially in middle and apical parts of the culms, indicated that terrestrial fungi (no direct contact with tidal exchange water) were less influenced by site-specific characteristics. However, in both sites, a few common indicator species for standing *Phragmites* culms could be identified. Flooding height (and frequency) is demonstrated to influence vertical species distribution. Generally rather complicated interactions and a narrow niche differentiation among species are revealed for the phragmiticolous fungal community.

**Key words:** ascomycetes, anamorphic fungi, coelomycetes, hyphomycetes, basidiomycetes, multivariate analysis, marine, freshwater, vertical distribution, spatial analysis, tidal marsh, decomposition.

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