Biodiversity Series 12: 21–46

Emerging lineages in the *Ophiostomatales*

Z. Wilhelm de Beer* and Michael J. Wingfield

Department of Microbiology and Plant Pathology, Forestry and Agricultural Research Institute (FABI), University of Pretoria, Pretoria 0002, South Africa

**Correspondence*: Z. Wilhelm de Beer, wilhelm.debeer@fabi.up.ac.za

Abstract: For many years, confusion between *Ceratocystis* and *Ophiostoma* obscured all major attempts to delineate genera and group species in the *Ophiostomatales*. The separation of *Ophiostoma* (*Ophiostomatales*) and *Ceratocystis* (*Microascales*), emerging from DNA-based phylogenetic inference, resulted in the *Ophiostomatales* being represented by the single genus *Ophiostoma* at the end of the 20th century. The aim of this study was to review the impact that DNA sequencing and phylogenetic analyses has had on the taxonomy of the *Ophiostomatales* over the past two decades. All available sequence data for the *Ophiostomatales* were screened, and we carefully selected representative ribosomal DNA sequences of 266 taxa in the order. We compiled these ribosomal large subunit and internal transcribed spacer region sequences in two data sets, containing 216 and 156 taxa respectively. Phylogenetic analyses of these data revealed six genera and 18 species complexes, and several lineages that could not be resolved. Five genera were well-defined: *Ophiostoma sensu stricto, Raffaelea s. str., Ceratocystiopsis*, *Fragosphaeria,* and *Graphilbum*, which was re-instated to accommodate species previously assigned to the *Pesotum fragrans* complex. However, several species complexes, including the *Sporothrix schenckii – O. stenoceras* complex, did not form part of *Ophiostoma s. str.* and were treated in *Ophiostoma sensu lato*. *Leptographium s. l.* was also not well-defined and included ten species complexes. Some of these complexes may represent distinct genera, but currently available sequence data are insufficient to define these. Our data also showed that *Raffaelea* is not monophyletic, and that the newly defined *R. lauricola* and *R. sulphurea* complexes group away from *Raffaelea s. str*., respectively in *Ophiostoma s. l.* and *Leptographium s. l.* Our approach in defining and naming genera was directed by the newly accepted one fungus : one name principles incorporated in the ICN at Melbourne in 2011, and we discuss the impact that these changes will have on the taxonomy of the *Ophiostomatales* in the near future. We also make recommendations for dealing with taxa in the less well-defined lineages in the interim, and until a more robust multigene phylogeny becomes available for the *Ophiostomatales*.

Key words: anamorph characters, ascoma morphology, generic concepts, rDNA phylogeny, single name nomenclature.