

## **S8-3**

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### **What is Going to Happen When Molecular Biology Explodes the Traditional Taxa of Simply Structured Fungi such as *Acremonium*?**

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Now that molecular biological techniques have been extensively applied to fungi, we have begun to see that the biosystematics of very simply structured filamentous fungi was left in a very primitive condition by 200 years of morphological study. For example, we now know that the traditional "species" *Fusarium solani* actually consists of over 50 species that are poorly morphologically distinguished. The genus *Acremonium* is still more simply structured than *Fusarium*. As might be expected, then, even very careful morphological work had yielded only preliminary resolution of the biodiversity contained within this form-taxon. In our laboratory, ex-type and good representative isolates were obtained for all described *Acremonium* species available in culture anywhere in the world. In addition, multi-isolate collections were obtained for some prominent, cosmopolitan species such as *Acremonium persicinum*. All isolates examined were sequenced at the nuclear ribosomal internal transcribed spacer locus, and all ex-types as well as some additional isolates were sequenced at the 28S ribosomal locus. Other sequences such as 18S ribosomal and actin were done where needed to obtain good resolution of clades and taxa. Results showed that *Acremonium* encompassed over 15 often remotely related genera of fungi spanning at least three fungal orders. Most of these generic-level clades could not immediately be linked to distinctive morphological features. However, a few of the clades, such as the one containing *Acremonium strictum* and *A. kiliense*, also contained more morphologically complex forms that had been given another genus name, in this case *Sarocladium*. It is an interesting nomenclatural question whether to transfer simply structured acremonioid forms in these clades into the genera originally conceptualized on the basis of the more complex forms. In principle, however, many fungal genera of complex structure may produce sub-lineages evolved as more simply structured entities, e.g., perithecial genera may spin off cleistothecial apomorphs. Arguably, it makes no sense to lump these simple structures together as pseudo-genera even if this would be convenient for the dwindling numbers of purely morphological fungal identifiers.

**Keywords**

*Acronium*, molecular biological techniques, morphological features, nuclear ribosomal internal transcribed spacer locus, 28S ribosomal locus