Analysis of genetic markers and ergovaline production in *Neotyphodium* endophyte-infected *Festuca* species collected from Italy, Spain and Denmark

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Festuca grasses from various natural habitats are often infected with *Neotyphodium* endophytes. Genetic variation among the endophytes and variation in their ability to produce ergovaline toxin is also reported. The objective was to determine the endophyte infection frequency, ergovaline production and genetic diversity of *Neotyphodium* and *Epichloë* endophytes in *Festuca* species sampled from locations in Italy, Spain and Denmark. Endophytes were detected in 57, 54 and 100% of locations in Italy, Spain and Denmark respectively. Endophyte positive *F. arundinacea* samples from Italian and Danish origin

were able to produce a relatively high quantity of ergovaline after 1 month incubation in the climate chamber. However, the isolates from Spain generally produced lower levels of the toxin. None of the *F. rubra* and *F. pratensis* produced ergovaline. A dendrogram based on microsatellite length polymorphism separated endophytes of each *Festuca* species. Further there was a pronounced genetic variation of the *F. arundinacea* endophytes between the countries and within the Italian and Spanish locations. Presently we are investigating the effect of plant genotype on the toxin production.