



## Are *Epichloë* endophytes specific to *Elymus* grass hosts?

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**ABSTRACT.** *Epichloë* endophytes are widely distributed mutualists of cool-season grasses and can protect their hosts against biotic and abiotic stresses. Previous studies have shown that *Epichloë* endophytes are specific to their grass hosts in tall *Festuca* and *Lolium* species. However, no systematic analysis exists of host specificity of asexual *Epichloë* endophytes and Chinese *Elymus* species. We analyzed the phylogenetic relationships between Chinese *Elymus* species and their diploid donor *Hordeum* species, using their corresponding *Epichloë* endophyte sequences. We found that 1) the maternal donor of the Chinese *Elymus* species was the Chinese *Pseudoroegneria* (St genome) or *Hordeum* (H genome); and 2) Chinese *Hordeum* species probably contained two species of *Epichloë* endophytes. One *Epichloë* endophyte was also present in a North American *Elymus* species. The other *Epichloë* endophyte was found in a Chinese *Elymus* species. Our results indicate that *Epichloë* endophytes isolated from *Elymus* species did not show grass-host specificity. 3) Plant hybridization could probably transform endophyte-free plants (E-) to endophyte-infected plants (E+). Based on

our data, we formulate hypotheses about which *Epichloë* endophytes were spread via plant hybridization.

**Key words:** *Elymus* species; *Epichloë* endophyte; *Hordeum* species; Host specificity; Maternal donor; Phylogeny