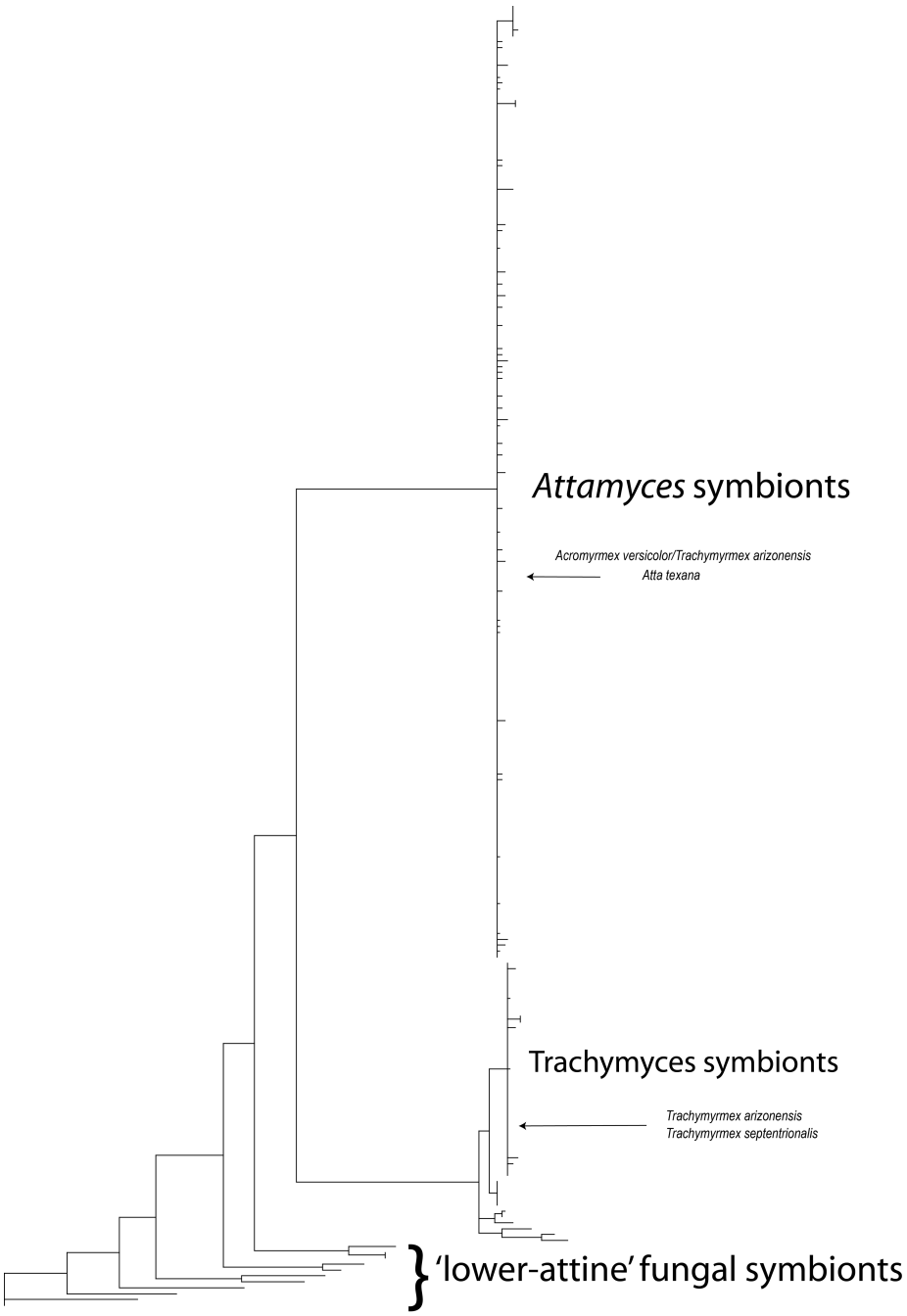

Figure S1. Preliminary phylogenetic relationships among the fungal lineages used in the experimental switches in our study. Phylogenetic relationships were inferred in a Bayesian analysis from a 475-nucleotide sequence of EF-1α. Arrows indicate, repectively, the close phylogenetic proximity between *Attamyces* from Arizona and Texas, and between the Trachymyces from Arizona and Texas. In addition to other species in the USA (not shown), *Attamyces* is cultivated by *Acromyrmex versicolor*, *Atta texana* and by some *Trachymyrmex arizonensis* nests, whereas Trachymyces is cultivated by *T. arizonensis* and *T. septentrionalis*.

Phylogentic reconstruction from Ulrich G. Mueller, Heather D. Ishak, Sofia M. Brushi, Alexander S. Mikheyev, Scott E. Solomon, Jarrod J. Scott, Michael Cooper, Henrik H. DeFine Licht,

Stephen A. Rehner, Ted R. Schultz, Mauricio Bacci Jr. In prep. Biogeography of the leafcutter ant-fungus mutualism. Unpublished manuscript.

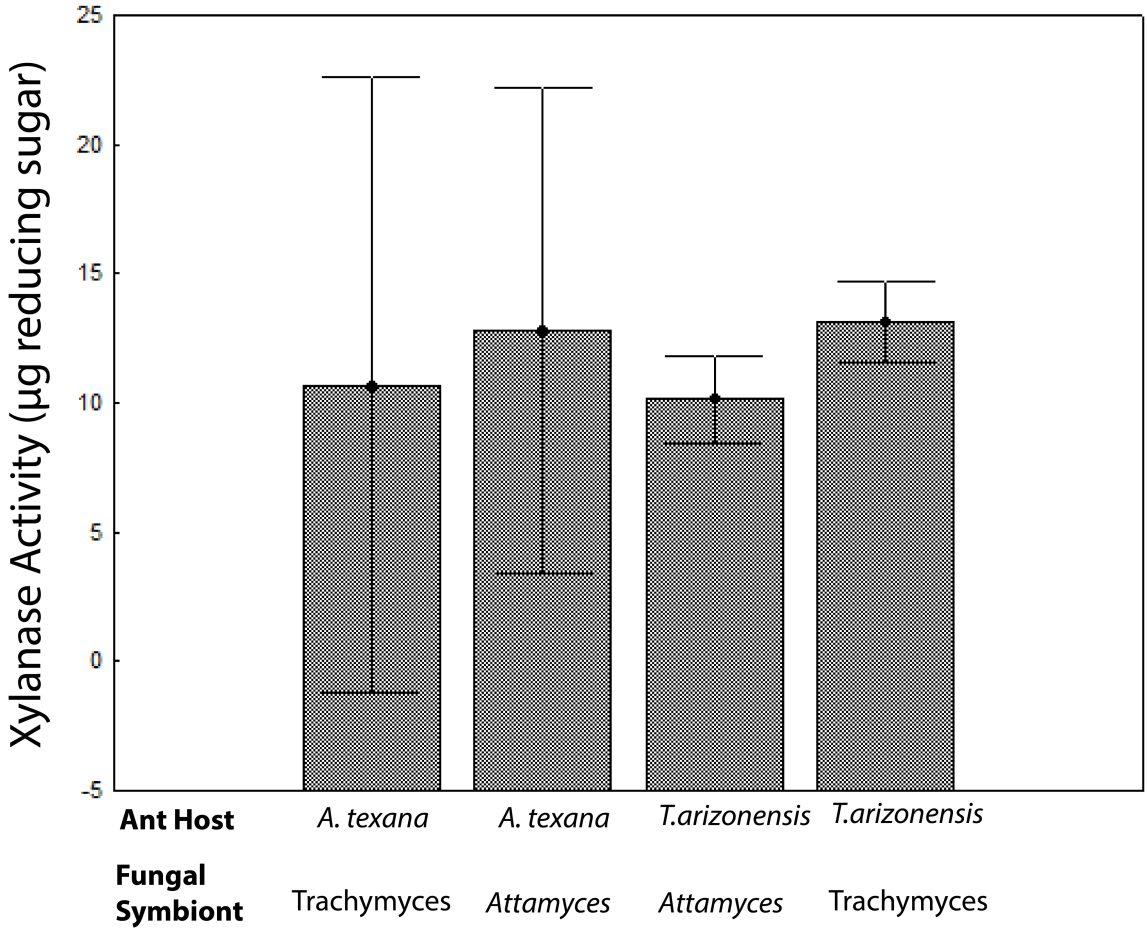

Figure S2. Mean xylanase activity (µg reducing sugar per mg/ml of fungus garden extract) in gardens for each experimental combination of ant (*Atta texana* or *Trachymyrmex arizonensis*) and fungal species (*Attamyces* or Trachymyces). No effects (ant, fungus, or interactions) were statistically significant (Table 1). Data were analyzed on $\log_{10}$ transformed data. Error bars are +/- 1 standard deviation. All effects except fungal symbiont species were significantly heteroscedastic.

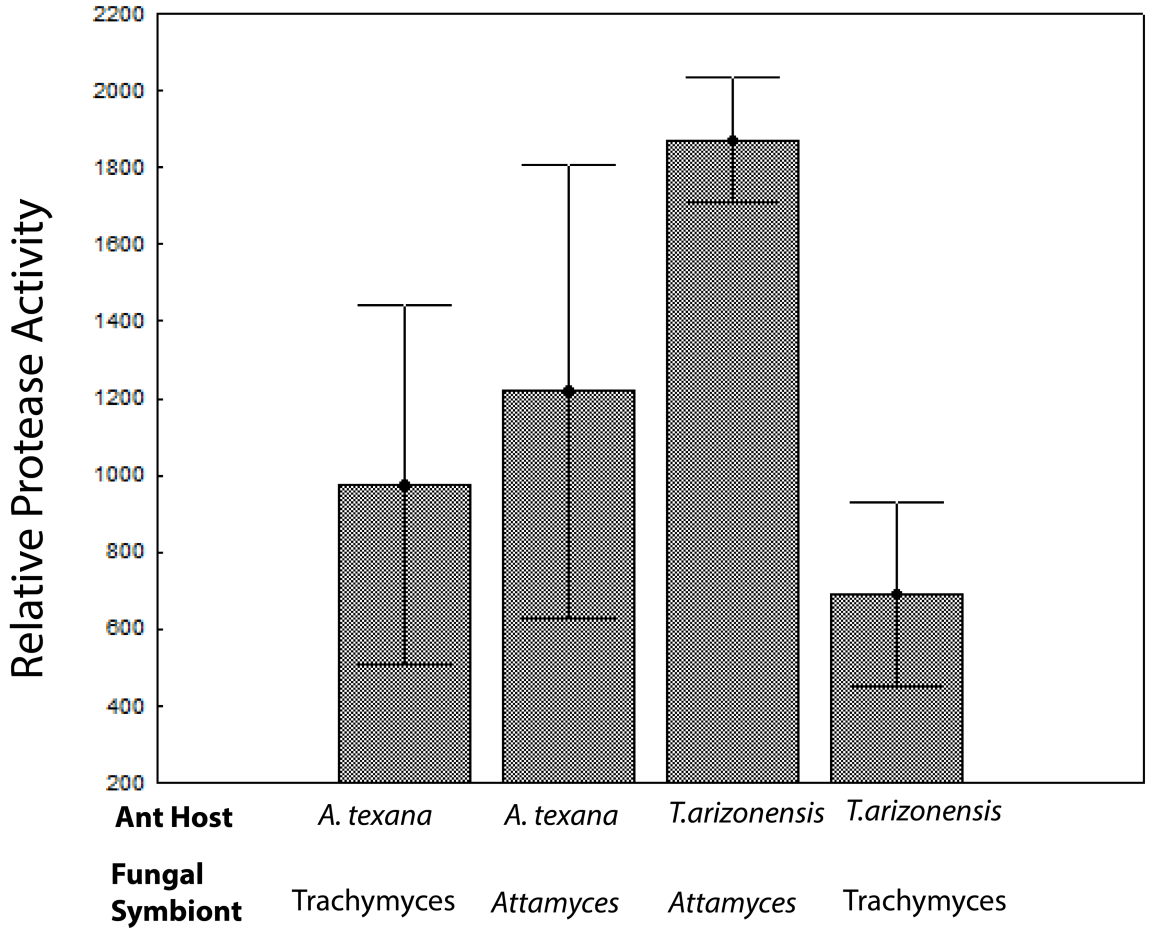

Figure S3. Mean protease activity (relative absorbance per mg/ml of fungus garden extract) in gardens for each experimental combination of ant (*Atta texana* or *Trachymyrmex arizonensis*) and fungal species (*Attamyces* or Trachymyces). *Attamyces* gardens showed significant higher protease activity than Trachymyces gardens. Ant-host species had no statistically significant effect on protease activity. Although there was a significant interaction between ant-host and fungus ($F_{1, 19} = 5.95$, p=0.025; gardens of *T. arizonensis* growing *Attamyces* exhibiting higher activities than when growing Trachymyces (Scheffé's test)), variances were heteroscedastic and were thus pooled (Table 1). Data were analyzed on $\log_{10}$ transformed data. Error bars are +/- 1 standard deviation. All effects except fungal symbiont species were significantly heteroscedastic.