



Fig. 1: Representatives of workers of fungus-farming ant genera and major clades, with the five agricultural systems indicated. (a) *Mycocepurus tardus*, (b) *Myrmicocrypta infuscata*, (c) *Apterostigma collare*, (d) *Kalathomyrmex emeryi*, (e) *Paramycoptophylax bruchi*, (f) *Mycetophylax simplex*, (g) *Mycetarotes parallelus*, (h) *Mycetosoritis hartmanni*, (i) *Cyphomyrmex auritus*, (j) *Cyphomyrmex longiscapus*, (k) *Cyphomyrmex rimosus*, (l) *Mycetagroicus triangularis*, (m) *Sericomyrmex parvulus*, (n) *Trachymyrmex cornetzi*, (o) *Trachymyrmex septentrionalis*, (p) *Acromyrmex octospinosus*, (q) *Acromyrmex versicolor*, and (r) *Atta laevigata*.

agriculture fungi are found both inside and outside the attine symbiosis, is consistent with a number of scenarios. One such scenario is that, as are some human crops, the attine cultivars are simply enslaved by the ants, i.e., the lower-attine symbiosis may be a parasitism (MUELLER 2002, SCHULTZ & al. 2005). Another scenario is that the lower-attine cultivars may have a bimodal life-history strategy, expressing separate suites of adaptations depending upon

environmental context (free-living or ant-associated). The latter scenario is supported by the apparent benefits that accrue to fungi when they are associated with ants (relative to fungi living in the leaf litter), including: (1) protection from the considerable competition from other microbes present in the leaf litter, with a corresponding increase in representation (in terms of biomass) in the next generation; (2) protection from parasites, pathogens, and fungivores;