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THE CULTIVAR SPECIALIZATION IN INSECTS AGRICULTURE

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ABSTRACT

In three insect orders, agriculture has developed independently: once in ants, once in termites, and seven times in ambrosia beetles. Despite the fact that these insect farmers are very distinct in some respects, they are strikingly similar in others, implying convergent evolution. Within their nests, all reproduce their cultivars as clonal monocultures, and in most instances, clonally over many farmer generations. Long-term clonal monoculture poses unique disease management challenges, but insect farmers have developed a variety of methods to combat crop diseases: They isolate their gardens from the rest of the world; they keep a close eye on them, controlling pathogens early in disease outbreaks; they occasionally access population-level storage tanks of genetically variable cultivars, while still propagating clonal monocultures across generations of farmers; and they manage, in addition to the primary cultivars, a variety of auxiliary microbes that provide disease suppression. Insect farmers seem to cultivate, and potentially "artificially select" for, integrated crop-microbe consortia rather than cultivating a single cultivar purely for nutrition. Crop domestication in the context of coevolving microbial consortia may, in fact, explain insect farmers' agricultural success.

KEYWORDS: *Agriculture, Beetles, Cultivars, Escovopsis, Macrotermitine.*

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