

The True Origin of Agriculture: Credit Goes to the Ants

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Human agriculture which is believed to have originated some 10,000 years ago has rightly been considered the most important development in the history of our species. Virtually all the plants which we consume today are derived from cultivars that have been bred and modified by humans for thousands of years. There has also been extensive exchange of cultivated crops from one part of the globe to another. While consuming plants and their products, we tend to forget that the cultivation of coffee originated in Ethiopia, that of tobacco around Mexico, tomato and potato in South America, rice in South East Asia and so on. The impact of agriculture on the further development of human societies has been profound – high rates of population growth, urbanization and economic surpluses all of which were pre-requisites for the development of modern civilization.

Impressive as all these are, our achievements are surely humbled by the lowly ants which appear to have invented agriculture, and as we shall see below – a fairly sophisticated type of agriculture – almost 50 million years before we did. Three different groups of insects practise the habit of culturing and eating fungi. They are ants belonging to the tribe Attini, macrotermite termites and certain wood-boring beetles. While the beetles in this group are few and not of com-

parable importance, the fungus growing ants in the new world, and termites in the old world, are ecologically very dominant. With a few exceptions, all fungus growing ants are also leafcutters – they cut pieces of leaves, bring them to the nest and use them as substrate to grow fungi. The ants derive their nutrition only from the fungi so grown and not from the leaves themselves. There are some 200 species of ants which do not know any life style other than fungus farming. Because of their ecological dominance and their insatiable hunger for leaves, leafcutter ants are major pests in the new world. These ants can devastate forests and agriculture alike – they may maintain ten or more colonies per hectare and a million or more individuals per colony. Where they occur, the leafcutter ants consume more vegetation than any other group of animals. Not surprisingly, many Latin American countries have passed national laws declaring leafcutter ants as ‘plague animals’.

Like in the humans, the advent of agriculture appears to have significantly affected the evolution of leafcutter ants. Today the leafcutter ants are among the most advanced and sophisticated social insects. As may be imagined, the process of fungus cultivation is a complicated business. In the field, leaves are cut to a size that is most convenient for an ant to carry them back. In the nest the leaf fragments are further cut into pieces 1–2 mm in diameter. Then the ants apply some oral secretions to the leaves and inoculate the fragments by plucking tufts of fungal