

IN SEARCH OF JAMAICA'S GARDENING ANT

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In 1995, Dr. Thomas Farr, then Zoologist Emeritus at the Institute of Jamaica, requested my help to photograph his most recent discovery, what he thought was the first record of a leaf cutter ant in Jamaica. For several days he had watched these ants take bits of leaves back to their nests. I settled down with camera ready to watch a strange nest which had been established just outside his office on the grounds of the Natural History Museum at East Street. After over three hours waiting I observed a single ant (a species then unknown to me) peeping out of the hole. He seemed to have sensed our presence and promptly retreated, and never reappeared even an hour later. We did not get the photographs. Dr. Farr explained that he had never seen more than three to six individuals outside of the nest at any given time and this had puzzled him as the leaf cutters he had seen in other parts of world generally march in mighty armies.

On Wood and Water Day 1995 the NHSJ visited Long Mountain. I was quite surprised to find numerous colonies of the same ant scattered over the hillside above the University Mona Woods. Since then Miss Dianne Wade (then an undergraduate student at the University of the West Indies) has worked with me on a short research project and the following account is based mainly on the results of this study. A comparison is done with one of the world's most famous leaf cutter ants, *Atta cephalotes*, which Miss Wade studied for a short time in Belize.

According to Huxley, there are approximately ten thousand species of ants in the world. These ants are social insects (i.e. several generations living together in one colony). There are approximately 180-200 species of ants which are not foragers, but are considered gardeners (Weber, 1972). These ants are the notorious "leaf cutters". These leaf cutter ants cut pieces of leaves from trees and may be seen marching back to their nests like an army equipped with umbrellas.

It was originally believed that these ants fed directly on the leaves brought into their nest. This misconception was rectified by Belt in 1874. According to his accounts the leaves were used as manure on which minute species of fungus were grown. The ants then feed on the fungus, which is a good source of nutrients. By this act of growing its

own food these gardeners are quite capable of overcoming stresses on population size due to limited food supply. This enables the establishment of very large colonies.

The abdomen the queens of leaf cutting ants get quite large and are a delicacy in some cultures. What these ants are best known for, however, is their role as an economic pest. Crop destruction by these ants has been documented throughout history. Examples of this include the destruction of citrus groves in Trinidad estimated at twelve percent of the annual crop value (Cherrette, 1968). Amante (1967) referred to the reduced productivity of pastures in one state of Brazil which has been estimated to be the equivalent of eight hundred thousand heads of cattle.



Entrance to the nest of the Jamaican gardening ant

The leaf cutters thrive on cultivated crops which are used in their gardens with great success. The large expanse of the cultivated areas means a ready supply of leaves. It is these characters that make coffee, citrus, and other cultivated crops likely targets of the "cutters" destructive gathering habits.

THE JAMAICAN LEAF CUTTER

The ant was later identified as *Trachymyrmex jamaicensis*, a species recorded from Jamaica and the Bahamas. Individuals are about 0.5 cm long, black head and abdomen with red thorax. The head is wide and both head and thorax are decorated with prominent spines. The mandibles are feeble and the eyes large. There is very little variation in size, i.e. the distinct sizes often seen in other ants species is absent. *Trachymyrmex jamaicensis* is a relatively small leaf cutter. *Atta cephalotes* is much larger, the big soldiers reaching 1.7 cm and smallest workers being 0.3 cm.

Colony: The number of individuals per colony was generally small. The largest colony of *Trachymyrmex jamaicensis* examined was 101 individuals. No wonder only a few individuals may be seen outside the nest at any given time. This is quite different from the case in *Atta cephalotes* where one colony was estimated to be over 2.5 million individuals.

Nest structure and size: The entrance to the nest of *Trachymyrmex jamaicensis* is usually marked by a 5 cm turret, a feature which is unlike that produced by any other ant in Jamaica. As the nests get older the turrets may be washed away leaving behind a tiny mound marked by small twigs, however, as soon as nest

building restarts, the turret is restored. There may be one to three openings leading to a single main tunnel. At the end of the tunnel is a single chamber, generally globular in shape. However there might be lateral extensions if the terrain does not allow for easy expansion. The largest chamber (colony size 101 ants) had an approximate volume of 36 ml (2 ½ table spoons).

The nests of *Trachymyrmex jamaicensis* are quite small compared to *A. cephalotes*. The colony of 2.5 million ants occupied some 44 chambers each 1.5 litres in volume, there was approximately one thousand entrances (some >25 cm in diameter) which were prominent mounds on the land scape.

Each *Trachymyrmex jamaicensis* colony had a dump 35 to 70 cm away from the nest opening. The waste consisted of parts of leaves, fungal hyphae, sand, seeds, insect parts, and ant corpse, all cemented together in small clumps by what appears to be resinous material. These dumps are often the most obvious signs of the presence of a colony.

Foraging: Ants were observed collecting small pieces of plant material from the surface of the soil. They carefully selected small dried pieces of leaves and were never observed actually cutting leaves. They often collected pieces of Guinep

(*Melicocca bijuga*) and Red Birch (*Bursera simaruba*). It is not known if there was a preference for these plants or if it simply resulted from the fact that these trees were the most common plants in the area. They also collected small fruits, eg. that of *Lantana*. The pieces of leaves that were dumped from the nests were smaller than that taken into the nest, suggesting that there was some cutting of the material in preparing the gardens.

In contrast, *Atta cephalotes* cuts leaves from trees and may strip an orchard in one night. Their feeding trails are quite prominent, having the appearance of a human track and are as much as 25 cm wide.

