

nor after I cut branches. A few workers emerged from cut branch bases. Only as I began to split stems did large numbers of workers swarm out. Abundant Homoptera were inside stems, and a few males and a few alate queens. There was abundant worker brood throughout.

I examined a 24cm long section in detail. The internodes contained "knöllen," discrete mounds of sticky bran-like material filled with nematodes, tiny dipteran larvae, and what appeared to be abundant stylets of Homoptera. (Knöllen are also found in nests of *Cecropia* ants (Müller 1880–1881, Longino 1991a), and are probably common to many or all stem-nesting *Azteca*.) There were pink coccids in the occupied internodes: 5, 7, 32, 31, 8, 7, 4 coccids in the 7 occupied internodes. There was a single pseudococcid in these 7 internodes. Many of the exit holes were originally large enough to accommodate a queen, but had been reduced to worker size with resinous carton. Some of the internodal septa were perforated, others not. There were perforated partitions made of resinous carton, which formed artificial septa. Some were found in the middle of internodes, others were partially closing chewed-out internodal septa.

There was one unoccupied internode in the middle of the branch, with solid septa on both sides. The sclerenchyma was thicker on the occupied side than the unoccupied side of the septa, as though the sclerenchyma were a secondary response to ant presence. The walls of ant-occupied internodes were black. The walls of unoccupied internodes were covered with flaky red brown material. Inner diameters of occupied internodes were greater than inner diameters of unoccupied internodes, but the sclerenchyma layer was thicker in the former, again suggesting that the sclerenchyma layer was a response to the ants.

The ant entrance holes were irregularly scattered, not in any predictable location. The terminal internodes, near the unoc-

cupied apical shoot area, were the most recently entered.

5 July 1991, Longino #2972: I climbed a 4m tall *Triplaris* tree. It contained a populous colony, and workers emerged onto trunk when I climbed tree. The largest branch segments I examined from this tree were 3cm dia., and still contained hollow internodes with ants. A large basal section contained relatively few workers and scattered pseudococcids, with no coccids. Exit holes were still maintained through 1cm of wood. I dissected 180cm of occupied branch. There were abundant brood, workers, carton partitions, and exit holes, much like #2956. There were scattered alate queens, and at least one male. Unlike #2956, there was no trace of pink coccids, and pseudococcids were widespread and common.

5 July 1991, Longino #2969-s: I cut one branch from a *Triplaris* tree. The terminal 20–40cm, the leafy part, was unoccupied. Lower in the branch, 2 founding queens of *Azteca longiceps* and *beltii* occupied adjacent cavities. The cavities of the two queens formerly were continuous through a perforated septum, but a plug of particulate matter separated the two. The plug was asymmetrical, as though built from the *beltii* side (Fig. 13).

#### *Azteca nigricans* complex

The queens of this complex have the mandibles with an even cover of large piligerous puncta, so that the mandibles are bristly. *Azteca nigricans* s.s. is known only from the type queen from Panama, JTL-001 occurs in the Pacific lowlands of Costa Rica, and JTL-002 occurs in the Atlantic lowlands. The three "species" recognized here differ in queen head size and relative scape length. However, samples are available from few localities, and knowledge of geographic variation in these characters is inadequate to confidently establish species boundaries.