The long, narrow heads of the species addressed in this paper may simultaneously provide great mandible strength and reduced head cross-section for entry into plant cavities in narrow stems.

Worker morphology may be much less constrained by nest site characters, and similarity between workers and queens may be the result of developmental constraints rather than strong selection on the workers. Strong selective factors acting on worker morphology are more likely to involve foraging and colony defense. These factors may vary little across *Azteca* species, and be independent of or only weakly influenced by nest site characters. Thus, there may be little selection for divergence in worker morphology between species.

Variation in queen mandible pilosity may also be strongly related to colony founding. The pilose mandibles of the *A. nigricans* complex are in striking contrast to the nearly hairless mandibles of the obligate *Cordia* and *Triplaris*-inhabiting species. Mandibles of *beltii* and JTL-007 exhibit intermediate degrees of pilosity. Differences in mandibular pilosity are not due to differential wear. Alate queens of *Cordia* and *Triplaris* ants that have yet to leave their natal nest have largely hairless mandibles, and the large puncta from which hairs arise would not be effaced by wear. *Azteca longiceps, pittieri* complex, and JTL-003 all appear to be primary occupants of specialized ant-plants. To found their colonies, they have to cut rapidly through plant tissue into a domatium. The smooth, hairless mandibles may be an adaptation for rapid cutting. *Azteca beltii* and JTL-007 have been found in ant-plants that have other primary occupants. Although there are no direct observations of founding behavior, the one observation of the close proximity of founding *longiceps* and *beltii* queens (Fig. 13) hints at the possibility that *beltii* and JTL-007 are secondary occupants of ant-plants. They may rely on the primary occupants to excavate entrances, entering subsequently and either fighting or walling off the primary occupant.

The stiff setae on the mandibles of ants in the *A. nigricans* complex appear as though they would impede cutting into plant stems. In the case of *Tetrathylacium costaricensis*, it is clear that the queens do not have to excavate an entrance hole to enter the stems; on maturation the stems split down the side, allowing ant entry. Perhaps ants in the *A. nigricans* complex, rather than being specialized to excavate entrances in a particular kind of hostplant, are instead specialized to find preexisting entrance holes into plant cavities, regardless of plant species. Strongly pilose mandibles may be an adaptation for efficient and rapid construction of carton nest material, which would be necessary to close large and/or irregular preexisting entrances.

These speculations regarding the functional aspects of queen head morphology deserve greater study. Direct and close observations of early nest establishment behavior by *Azteca* queens are needed.

Problems of Species Definitions

The *A. pittieri* complex exhibits at least one area where two morphologically diagnosable groups of organisms are parapatric, with the zone of sympatry being less than 5km wide. However, the characters that are diagnostic in this area are not stable in other parts of the range. Taxonomists routinely face this level of knowledge about patterns of organismal diversity, and the frequency of encountering patterns such as this can only increase with the current emphasis on intensive biodiversity inventories at the national or more local scale (Janzen 1991, Longino 1994, Stork 1994). How taxonomists treat this situation nomenclaturally underlies the conflict that often occurs between the local field collector's and the museum taxonomist's definitions of species (Gentry 1990).

Parapatric boundaries between diagnos-