

DISCUSSION

In *table I* are noted the presence or absence of 11 anatomical character states that appear to be associated with social parasitism in *Pheidole*, and in many other ant genera as well. All of the nine known or likely social parasites in *Pheidole* are specified, from a direct study I have made of specimens of every species except *argentina* (this form is described with exceptional thoroughness by BRUCH in his 1932 article). The identification and designation of primitive and derived character states is in accord with widely accepted procedures of phylogenetic systematics, including cladistic analysis (see, for example, WILEY, 1981).

The matrix is ordered from top to bottom, that is, from *inquilina* to *acutidens*, according to the increasing parasitic specialization of the species. In each case, the positive character state is provisionally considered derived from the more primitive alternative state or set of states found in the hundreds of other species of *Pheidole*. Such can be safely assumed to be true for loss of the worker caste, lengthening of the scape, reduction of the number of antennal segments, and reduction of the mandibles and propodeum. It is less certain in the cases of the reduction of queen size, rounding of the occiput, reduction of sculpturing (producing a shiny surface), and lightening of color. Two forms of postpetiolar broadening occur and are lumped together in *table I*: an extreme widening of the node into conules, which may or may not be derived, and a simultaneous widening of the segment and its complete attachment posteriorly to the first gastric segment, which is almost certainly derived.

An examination of the matrix reveals two apparent phylogenetic trends of interest:

- 1) The character states were often not acquired in concert; in other words, there was a substantial amount of mosaic evolution.
- 2) The earliest changes to occur were loss of the worker caste, reduction of size, rounding of the occiput, lengthening of the scape, loss of body sculpture, and broadening of the postpetiole. These shifts were followed by reduction of the funicular segments, including the 3-segmented club, and of the mandibles.

We have only begun the exploration of social parasitism in the huge genus *Pheidole*, which is cosmopolitan in distribution, contains over 1 000 named forms, and probably exceeds *Camponotus* in abundance of colonies in most habitats (WILSON, 1976).

Where do most of the parasitic species of *Pheidole* occur? I will be so bold as to predict that a large majority remain undiscovered, and that most of them occur in the tropics. More precisely, the largest absolute numbers are likely to occur in the tropics, although a higher *percentage* of the