

Class 4 includes at least the females of most of the really extreme work-
erless permanent social parasites, for example, *Anergates atratulus*, *Teleu-
tomyrmea schneideri* (Gösswald, 1953), *Anergatides kohli*, *Bruchomyrma
acutidens*. *Bregmatomyrma carnosa*, an enigmatic oriental formicine known
only from the queen caste and probably parasitic, lacks bulla and meatus.
Several known or assumed temporary social parasites also belong here,
for example, queens of *Aphaenogaster tennesseensis* and *A. mariae* and of
Rhoptromyrmea species (particularly *R. transversinodis*), *Chalepoxenus
gribodoi* and *C. mullerianus*, *Myrmica colax*, *Lasius fuliginosus* and allied
species, *Acanthomyops latipes* and *A. murphyi*, *Polyergus rufescens*, *P.
lucidus*, and *P. mandarin*. However, females of a number of known or rea-
sonably assumed parasites, both of the temporary and permanent sorts,
have bulla and meatus well developed or only moderately reduced; ex-
amples are *Formica* of the *microgyna* and *rufa* groups (broad sense);
Bothriomyrmea atanticus, *flavus*, *pusillus*, and *wroughtoni*; *Crematogaster
atitlanica*; *Pseudoatta argentina*; *Leptothorax* (including *Formicoxenus*)
nitidulus and *dueoticus*; all three species of *Harpagoxenus*; *Rossomyrmea
proformicarum*; *Pheidole* (including *Epipheidole*, *Sympheidole*, *Eriophei-
dole*) *elecebra*, *inquilina*, and *symbiotica*; and *Myrmecia inquilina*.

In queens of the few parasitic Dacetini scattered in genera *Strumigenys*,
Serrastruma and *Kyidris*, the bulla is present, but it was not possible to
be sure whether the meatus was present and open, or closed. Only study
of the internal parts will show whether the listed species have functional
glands or not.

What do these four classes of ants have in common? For class (2),
we cannot say; hardly anything is known of the behavior of most myrmi-
cine males inside the nest or outside, and the genera named are no excep-
tions. But for classes (1), (3), and (4), we have an obviously common
behavioral thread. All of these forms—doryline males, parasite queens, and
Polyergus workers—must enter ant colonies other than the ones in which
they were reared. In each case, unopposed entry is necessary for the sur-
vival of the entering species. Doryline males must mate with wingless
queens that are closely attended by massed workers in alien nests of the
same species; parasite queens must gain acceptance to avoid being killed
by the workers of the host nest that will rear their brood; *Polyergus* work-
ers, wholly dependent on captured *Formica* slaves, need to make their slave
raids into *Formica* nests with minimal opposition from the adult worker
inmates.

All this suggests to me a hypothesis about the function of the meta-
pleural gland: the gland produces a substance that, when tasted or smelled,
says to another ant colony, especially one of the same species, "I am an
enemy." This does not require a nest odor in the sense that seems implicit
in most discussions and experiments on the matter, though one would have
to suppose that nest mates do not attack one another because their odor
or taste is so similar that the difference signifying "enemy" does not exist.
Such within-colony similarities could well be due to food sharing (trophall-