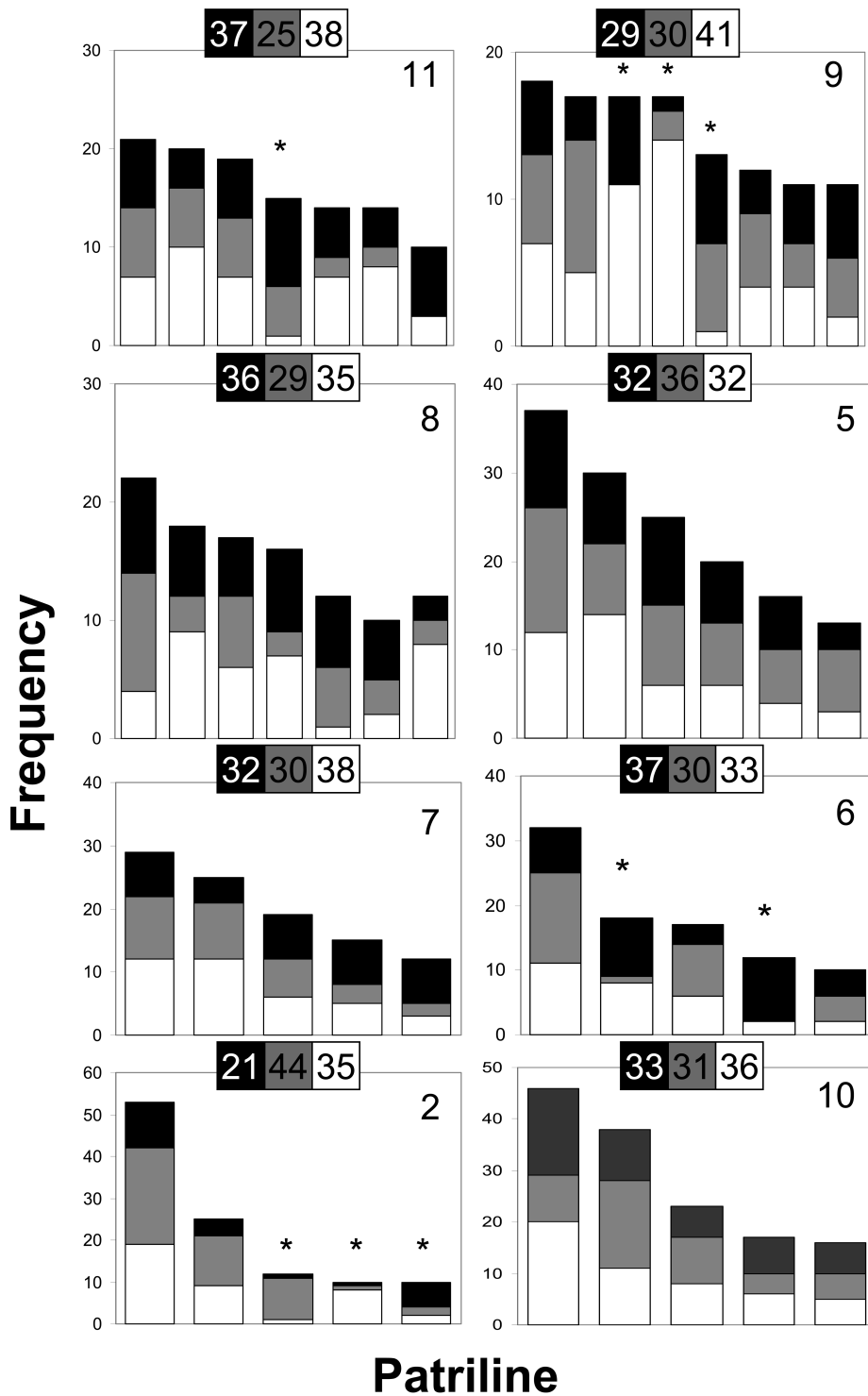


**Appendix from C. R. Smith et al., “Caste Determination in a Polymorphic Social Insect: Nutritional, Social, and Genetic Factors” (Am. Nat., vol. 172, no. 4, p. 497)**

Nitrogen isotope ( $^{14}\text{N}$  and  $^{15}\text{N}$ ) ratios tend to reflect relative trophic position because the isotopes differ in their propensity to be incorporated into tissue; the heavy isotope ( $^{15}\text{N}$ ), though at lower natural abundance, is incorporated in tissue more readily than the lighter isotope. Thus, across more trophic exchanges (moving up the food chain), the ratio of  $^{15}\text{N} : ^{14}\text{N}$  increases. Furthermore, animals at higher trophic levels tend to incorporate greater amounts of N. Thus, %N and C : N also reflect relative trophic position. Similar to N isotopes,  $^{12}\text{C}$  and  $^{13}\text{C}$  differ in how readily each is incorporated into plant tissue depending on the carbohydrate synthesis pathway. The C3 plants tend to have a much lower ratio of  $^{13}\text{C} : ^{12}\text{C}$  than do the C4 plants (DeNiro and Epstein 1978); the  $^{13}\text{C} : ^{12}\text{C}$  ratio in tissues of consumers reflects the plant source of their carbon.



**Figure A1:** Bias in the castes produced by patriline across eight colonies of *Pogonomyrmex badius*. The number in the upper right of each panel denotes the colony and can be used to cross-reference with tables. Within each panel, the X-axis denotes patriline and the Y-axis their frequency in the colony (note that the Y-axis scales differ among colonies), and colors represent castes (*black* = gynes, *gray* = major workers, and *white* =

**App. from C. R. Smith et al., "Caste Determination in a Social Insect"**

minor workers). An asterisk above a patriline indicates a significant bias in the castes produced compared with expected values. The color-coded boxes above each panel contain the percent of individuals of each caste that a patriline was expected to produce (i.e., the percent of the total colony sample). A total of 48 patrilines were tested, and nine had a significant caste bias.