predominantly or exclusively in litter samples and were seldom (or never) observed foraging in exposed situations; epigaeic species were those which commonly foraged aboveground (some of these were also found in litter and soil).

Using this classification, the two groups of ants are shown to be differentially affected by the presence of *I. humilis* (table 5). While the mean number of epigaeic species is strongly reduced at sites with *I. humilis* (t-test, $p \approx 0.000$), the difference in the mean number of hypogaeic species at the two kinds of sites is much less marked and not statistically significant (t-test, $p \approx 0.075$).

The specific composition of the ant fauna of these sites is given in table 6, and reveals further differential sensitivity to the presence of *I. humilis*. For the six most common ant species, the results are as follows: Three epigaeic species (*Liometopum occidentale, Tapinoma sessile,* and *Formica occidua*) are very adversely affected by the presence of *I. humilis,* being absent from all sites where it occurs while present in most unoccupied sites (G-tests, $p < .001$ in all three cases). One epigaeic species (*Prenolepis imparis*) and two hypogaeic species (*Stenamma diecki* and *Stenamma californicum*) appear to be much less influenced by *I. humilis* insofar as they are equally present in the two kinds of sites. An analysis of the abundance of these three species, based on the numbers of *P. imparis* workers at tunafish bait and the numbers of *S. diecki* and *S. californicum* workers in litter samples, shows no significant differences between the two kinds of sites (table 7); results, however, suggest that larger sample sizes might reveal a negative effect of *I. humilis* on the abundance of *P. imparis.*

The remaining 22 species of ants are less common and more locally distributed in general, so that it is more difficult to assess the impact of *I. humilis* on their occurrence. It is striking, however, that 14 of these 22 species were recorded only from *I. humilis*-free sites; no species was confined to sites occupied by *I. humilis.*

The preceding analyses are based on the results of surveys undertaken in 1984-85. One of the valley riparian sites (site 21, 6km W Capay, Yolo County), recorded as unoccupied by *I. humilis* during the original survey, was found to contain colonies of *I. humilis* in 1986. The colonization appears to be recent. Nests occur along a roadside margin and workers have been observed foraging in dense files on valley oaks (*Quercus lobata*) at the edge of the small tract of riparian woodland, but not in the center. An adjacent, irrigated almond orchard is heavily infested with *I. humilis* and may represent the source population. *Liometopum occidentale,* abundant at the riparian site in 1984, has now disappeared. At the time of this writing (October 1986) the epigaeic species, *Formica occidua* and *Prenolepis imparis,* are still present and common.

TABLE 7. ABUNDANCE OF *PRENOLEPIS IMPARIS, STENAMMA DIECKI,* AND *S. CALIFORNICUM* AT RIPARIAN SITES WITH AND WITHOUT *I. HUMILIS**

Sites		*P. imparis*	*S. diecki*	*S. californicum*
With *I. humilis*	Mean no. workers	104.6	4.9	1.8
(n = 10)	Range	0-503	0-12	0-8
Without *I. humilis*	Mean no. workers	220.8	8.8	3.9
(n = 12)	Range	0-619	0-32	0-22
Mann-Whitney U test, probability (one-tailed)		.073	.472	.431

*Abundance at a site is measured by the number of workers at tunafish bait (*P. imparis*) or in litter samples (*Stenamma* spp.).