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More Mixed Colonies in Ants

R. L. KING and R. M. SALLEE

At the meeting of the Academy two years ago (King, '49) nine mixed colonies of ants containing *Formica reflexa* and *Formica fusca* were reported. Seven of these had failed to survive the winter following their discovery; of the other two, found in 1948, only one survived the winter of 48-49 and contained only *F. reflexa* in 1949. This pure colony of *F. reflexa*, the only one ever reported, was deserted by the early summer of 1950. Two new mixed colonies were found in 1949 near the Iowa Lakeside Laboratory, Dickinson County, Iowa: only one of these survived the winter of 49-50; during the summer of 1950 it was still mixed. The rarity of pure colonies of this species tends to confirm the suggestion of Buren ('42) that *F. reflexa* is a permanent social parasite on *Formica fusca*.

The other unusual type of mixed colony involved the species *Formica fossiceps* and *Formica oreas comptula*, which have similar nesting habits and produce sexual forms at about the same time. Pure colonies of these two species are not uncommon in Dickinson County, Iowa; much less frequently the two species are present in the same colony. These have become mixed apparently because of the habit of adopting newly fertilized females into the nest; the females adopted are usually of the same species but occasionally a female of the other species may be adopted, or force or insinuate herself into the nest. A colony of *Formica fossiceps* (IN) which was pure when first discovered, later became mixed; likewise a pure colony of *Formica oreas comptula* (XV) later became mixed. It is the purpose of this paper to bring the records of the surviving mixed colonies already reported up to date, and to add data on new mixed colonies.

Collections of workers from colony IN in 1949 included 146 *oreas comptula* and 136 *fossiceps*, in 1950, 67 *oreas comptula* and 54 *fossiceps*; no sexual forms were collected. This brings the total of workers for this colony to 403, 213 (53%) *oreas comptula* and 190 (47%) *fossiceps*. One of the former was a pseudogyne. Only one male and one female, both *fossiceps*, have been collected from this colony. Colony XV was deserted in 1949. From colony 48K, 214

workers were collected in 1950: 195 (91%) *oreas comptula* and 22 (9%) *fossiceps*, three males collected were *oreas comptula*. This nest was first collected from in 1948.

Most extensive collections have been made from colony XU, which is pleasantly close to the laboratory. In 1949 1260 workers and 221 males were collected from this nest; of the workers 908 (72%) were *oreas comptula* and 352 (28%) were *fossiceps*. These workers are being used for an extensive biometric comparison of the two species; here it may be said that the same size series of workers of both species is present, but the proportion of workers of various sizes probably is different. All the males collected in 1949 (221) were *oreas comptula*. Of 231 workers collected in 1950, 177 (77%) were *oreas comptula* and 54 (23%) were *fossiceps*; all the males (38) were *oreas comptula*. The grand total for colony XU (1946-1950) is 2468 workers: 1711 (69%) *oreas comptula* and 757 (31%) *fossiceps*; seven of the *fossiceps* workers were pseudogynes. For males the grand total is 324, all *oreas comptula*.

Colony G1 was found in 1950; 150 workers and 54 females were collected: 51 (34%) of the workers were *oreas comptula* and 99 (66%) *fossiceps*; 36 (67%) of the females were *oreas comptula* and 18 (33%) *fossiceps*. These results are to be expected if fertilized females of both species are laying eggs in the colony. The females of *fossiceps* are distinctly smaller than those of *oreas comptula*; this size difference holds also for females from this mixed nest.

Thirty *F. fossiceps* workers were collected from newly discovered colony G3 in 1949. In 1950, males of *fossiceps* and *oreas comptula* were present in this colony, so extensive collections were made: all (469) workers were *fossiceps*; of 55 males, 14 (25.5%) were *oreas comptula* and 41 (74.5%) *fossiceps*. The most likely explanation of this is that there is present in the colony one or more unfertilized *oreas comptula* females in addition to the fertilized *fossiceps* females. A less likely explanation is that the fertilized females are hybrids between the species; the whole set of genes from *fossiceps* are dominant to the *oreas comptula* set. One might expect to find some intermediates among the males under these conditions. The future history of this colony, and of others which we hope to find, will, perhaps give us the answers to many of the questions raised by these mixed colonies.

Selected References

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